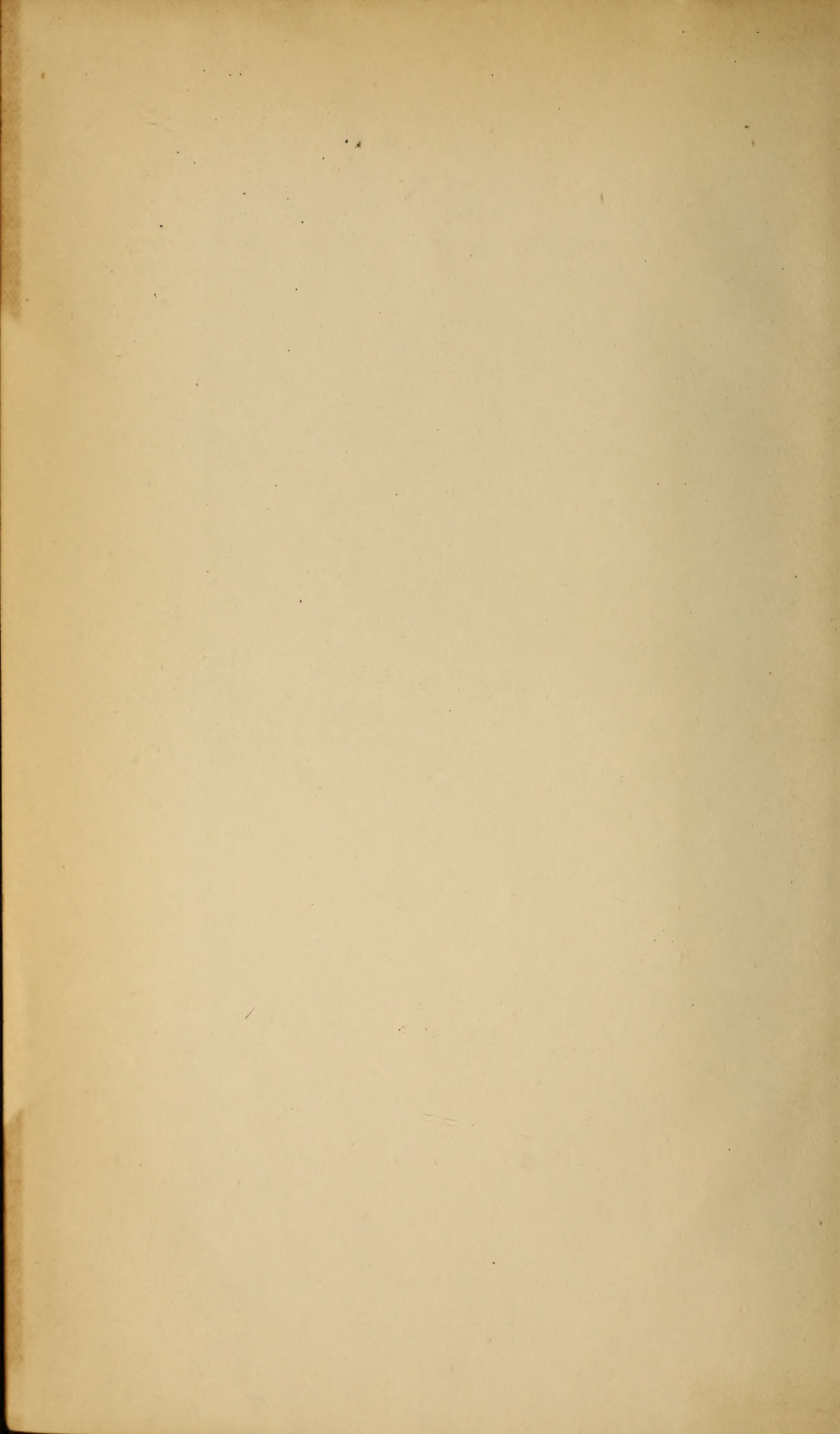


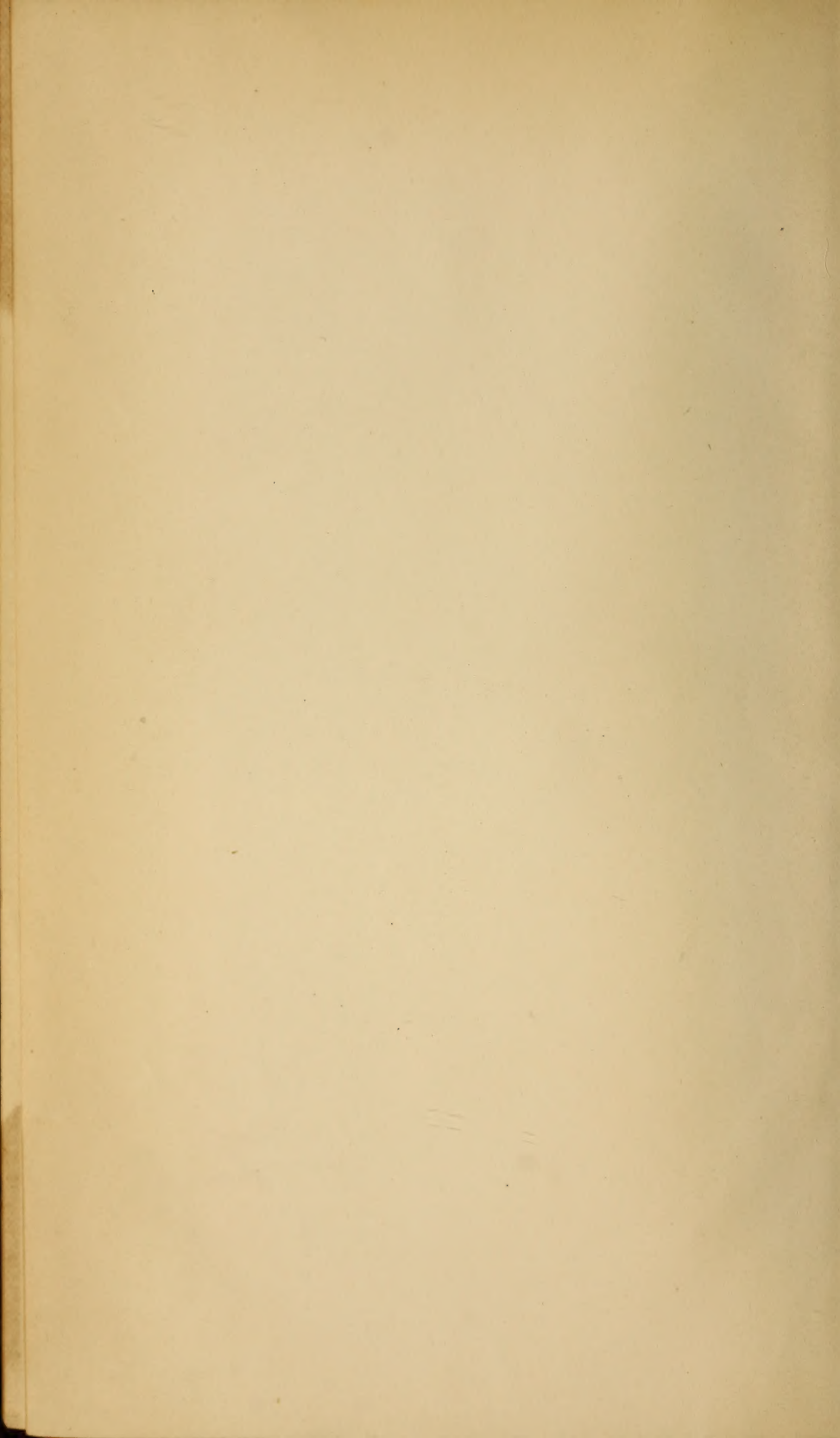




Property of the
Lancaster City and County
Medical Society

No.





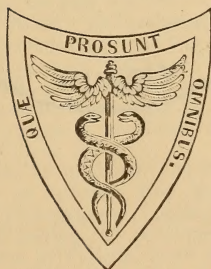
THE
AMERICAN JOURNAL
OF THE
MEDICAL SCIENCES.

EDITED BY
ISAAC HAYS, M.D.,
FELLOW OF THE COLLEGE OF PHYSICIANS OF PHILADELPHIA; MEMBER OF
THE ACADEMY OF NATURAL SCIENCES OF PHILADELPHIA, AND OF THE AMERICAN
PHILOSOPHICAL SOCIETY; ASSOCIATE FELLOW OF THE AMERICAN
ACADEMY OF ARTS AND SCIENCES,
&c. &c. &c.

ASSISTED BY
I. MINIS HAYS, M.D.

NEW SERIES.

VOL. LXVIII.



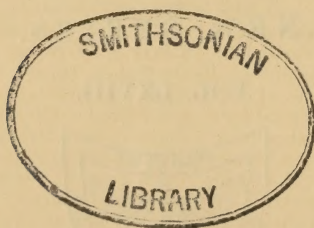
PHILADELPHIA:
HENRY C. LEA.
1874.

69494

Entered according to the Act of Congress, in the year 1874, by

HENRY C. LEA,

in the Office of the Librarian of Congress. All rights reserved.



PHILADELPHIA:
COLLINS, PRINTER,
705 Jayne Street.

610.5
A513
v.68
Med.

TO READERS AND CORRESPONDENTS.

All articles intended for the *Original Department* of this Journal must be contributed to it *exclusively*. The insertion elsewhere of *abstracts* of papers *prior* to the publication of the entire paper in this Journal is a violation of this rule. As original articles are *accepted only on this condition*, we consider those who favour us with contributions to be bound in honour to conform to it.

Several original articles and bibliographical notices in type have been laid over for want of room. We ask the indulgence of our contributors, and assure them that their favours shall receive early attention.

Contributors who wish their articles to appear in the next number are requested to forward them before the 1st of August.

Compensation is allowed for original articles and reviews, except when illustrations or extra copies are desired. A *limited* number of extra copies (not exceeding *fifty*) will be furnished to authors, *provided the request for them be made at the time the communication is sent* to the Editors.

The following works have been received :—

Transactions of the Obstetrical Society of London. Vol. xv. for 1873. London : Longmans, Green & Co., 1874.

Guy's Hospital Reports. Third Series. Vol. xix. London : J. & A. Churchill, 1874.
The West Riding Lunatic Asylum Medical Reports. Edited by J. CRICHTON BROWN, M.D., F.R.S.E. Vol. ii. and iii. London : Smith, Elder & Co., 1873.

The Baths and Wells of Europe; their Action and Uses, with Notices of Climatic Resorts and Diet Cures. By JOHN MACPHERSON, M.D. With a Map. Second edition, revised and enlarged. London : Macmillan & Co., 1873.

On the Origin and Development of the Coloured Blood Corpuscles in Man. By Dr. H. D. SCHMIDT, New Orleans.

The After-treatment of Large Amputations. By ROBERT HAMILTON, F.R.C.S.

The Psychology of Scepticism and Phenomenalism. By JAMES ANDREWS. Glasgow : James Maclehose, 1874.

On some Cases of Contracted Burn Cicatrix treated by the Tagliacotian Operation. By JAMES HARDIE, M.D., Surgeon to the Clinical Hospital, Manchester.

Lectures on the Clinical Uses of Electricity. By WALTER Y. SMITH, M.D., Dublin, Assist. Phys. to Adelaide Hosp. Dublin : Fannin & Co., 1873.

Dr. Hoffmann's Medicinischer Führe durch Wien. Wien : Karl Czermak, 1874.

A Treatise on Pharmacy; designed as a Text-book for the Student, and as a Guide for the Physician and Pharmacist. By EDWARD PARRISH, late Prof. of Theory and Practice of Pharmacy in Phila. Coll. of Pharmacy, etc. Fourth edition, enlarged, and thoroughly revised by THOMAS S. WIEGAND, Graduate of the Phila. Coll. of Pharmacy. Philadelphia : Henry C. Lea, 1874.

Lectures on the Diseases of Infancy and Childhood. By CHARLES WEST, M.D., F.R.C.P., Phys. to the Hospital for Sick Children. Fifth American, from the sixth revised and enlarged English edition. Philadelphia : Henry C. Lea, 1874.

A Conspectus of the Medical Sciences, for the Use of Students. By HENRY HARTSHORNE, A.M., M.D., Prof. of Hygiene in the Univ. of Penna., etc. Second edition, enlarged and thoroughly revised. Philadelphia : Henry C. Lea, 1874.

A Treatise on Food and Dietetics, Physiologically and Therapeutically considered. By F. W. PAVY, M.D., F.R.S., Phys. to, and Lecturer on Physiology at, Guy's Hospital. Philadelphia : Henry C. Lea, 1874.

Materia Medica, for the Use of Students. By JOHN B. BIDDLE, M.D., Prof. of Mat. Med. and Gen. Therap. in Jefferson Med. Coll. Sixth edition, revised and enlarged, with illustrations. Philadelphia : Lindsay & Blakiston, 1874.

A Manual of Toxicology, including the Consideration of the Nature, Properties, Effects, and Means of Detection of Poisons, more especially in their Medico-Legal Relations. By JOHN J. REESE, M.D., Prof. of Med. Jurisprudence and Toxicology in the University of Pennsylvania, etc. Philadelphia : J. B. Lippincott & Co., 1874.

A Treatise on Therapeutics, comprising Materia Medica and Toxicology, with especial reference to the Application of the Physiological Action of Drugs to Clinical Medicine. By H. C. WOOD, JR., M.D., Prof. of Botany and Clin. Lect. on Dis. of Nervous System in Univ. of Penna., etc. Philadelphia : J. B. Lippincott & Co., 1874.

Ligation of Arteries. By Dr. L. H. FARABEUF, Aide d'Anatomie à la Faculté, Ancien Interne des Hôpitaux de Paris. Translated by JOHN D. JACKSON, M.D., of Danville, Ky. Philadelphia: J. B. Lippincott & Co., 1874.

An Introduction to the Study of Practical Histology. For Beginners in Microscopy. By JAMES TYSON, M.D., Vice-Director of the Biological and Microscopical Section Acad. of Nat. Sci., Phila., etc. Philadelphia: J. B. Lippincott & Co., 1873.

Outlines of Comparative Anatomy and Medical Zoology. By HARRISON ALLEN, M.D., Prof. of Zool. and Comp. Anat. in Univ. of Penna. Second edition. Philadelphia: J. B. Lippincott & Co., 1874.

A Practical Treatise on the Surgical Diseases of the Genito-Urinary Organs, including Syphilis. By W. H. VAN BUREN, A.M., M.D., Prof. of Principles of Surgery, with Dis. of Genito-Urinary System and Clin. Surg. in Bellevue Hosp. Med. Coll., etc., and E. L. KEYES, A.M., M.D., Prof. of Dermatology in Bellevue Hosp. Med. Coll., etc. New York: D. Appleton & Co., 1874.

Inflammation of the Lungs: Tuberculosis and Consumption. Twelve Lectures. By Dr. LUDWIG BUHL, Prof. of Path. Anat. and Gen. Path. in Univ. of Munich, etc. Translated, by permission, from the second German edition, by MATTHEW D. MANN, M.D., and SAMUEL B. SR. JOHN, M.D. New York: G. P. Putnam's Sons, 1874.

Observations on the Pathology and Treatment of Cholera; the result of forty years' experience. By JOHN MURRAY, M.D., Inspector-Gen. of Hospitals, late of Bengal. New York: G. P. Putnam's Sons, 1874.

The Treatment of Syphilitic Diseases by the Mercurial Vapor Bath. By LANGSTON PARKER, F.R.C.S.L. Compiled from the fifth London edition by JOHN W. FOYE, M.D. Boston: A. Williams & Co., 1874.

Anatomy of the Invertebrata. By C. TH. V. SIEBOLD. Translated, with Additions and Notes, by WALDO J. BURNETT, M.D. Boston: James Campbell, 1874.

Treatment of Nervous and Rheumatic Affections by Static Electricity. By Dr. A. ARTHUS. Translated by J. H. ETHERIDGE, M.D. Chicago, 1874.

Climate in Pulmonary Consumption, and California as a Health-Resort. By LEWIS ROGERS, M.D. Louisville, 1874.

Report on the Treatment of Fractures. By J. B. HAMILTON. Chicago, 1873.

The Mutual Relations of Druggists and Physicians. By CHARLES E. BUCKINGHAM, M.D. Boston, 1874.

On the Connection of Throat and Other Diseases—Syphilitic Membranoid Occlusion of the Rima Glottidis. By L. ELSBERG, M.D., Clin. Prof. of Dis. of Throat in Univ. of N. Y. New York, 1870.

Boylston Medical Society of Harvard University, Catalogue, March, 1874.

The Conditions of the Conflict. By ALEXANDER HUTCHINS, M.D. New York, 1874.

Some Medical Pilgrimages Abroad. By RALPH M. TOWNSEND, M.D. Philadelphia, 1874.

Addresses delivered at the Fifty-second Annual Commencement of the National Medical College, March 4, 1874. Washington, 1874.

Urethrotomy, External and Internal Combined, in Cases of Multiple and Difficult Stricture, with Remarks on the Urethral Calibre. By FESSENDEN N. OTIS, M.D., Clin. Prof. of Ven. Dis. in Coll. of Phys. and Surg., N. Y. New York, 1874.

Remarks on the Management of the Intermaxillary Bone in Double Hare-lip. By W. R. WHITEHEAD, M.D., of Denver, Col. Denver, 1874.

Medical and Pharmaceutical Notes. By EDWARD R. SQUIBB, M.D. Philadelphia, 1874.

Contributions to the Study of Yellow Fever. By J. M. TONER, M.D., and JOHN M. WOODWORTH, M.D. Washington, 1874.

Cerebro-Spinal Meningitis in Massachusetts in 1873. By J. BAXTER UPHAM, M.D. Boston, 1874.

Herpes Gestationis; a rare Affection of the Skin peculiar to Pregnancy. By L. DUNCAN BULKLEY, M.D. New York, 1874.

Skin-Grafting. By R. J. LEVIS, M.D., Surgeon to the Pennsylvania Hospital.

Writer's Cramp, or Scrivener's Palsy. By REUBEN A. VANCE, M.D. Boston, 1873.

Esmarch's Bloodless Operation on the Extremities, with Cases. By PAUL F. EVE, M.D., of Nashville, Tenn.

Post-mortem Changes *versus* Ante-mortem Lesions. The Medical Colleges, the Medical Profession, and the Public. By STANFORD E. CHAILLE, A.M., M.D.

Diagnosis of the Nerves of the Human Body; exhibiting their Origin, Divisions, and Connections, with their distribution to the various regions of the Cutaneous Surface and to all the Muscles. By WILLIAM HENRY FLOWER, F.R.S. Second Am. from

second Eng. ed. Edited, with additions, by WILLIAM W. KEEN, M.D., Lect. on Anat. and Op. Surgery in Phila. School of Anatomy. Philadelphia: Turner Hamilton, 1874.

Extract from a Report of the Surgery of Tennessee. By WM. T. BRIGGS, M.D., Prof. of Prin. and Prac. of Surgery in Univ. of Nashville. Nashville, 1874.

Medical Problems of the Day. By NATHAN ALLEN, M.D., LL.D. Boston, 1874.

The Vital Statistics of New Orleans, from 1769 to 1874. By STANFORD E. CHAILLE, A M., M.D., Prof. of Phys. and Path. Anat. Univ. of La.

What Effect does Syphilis have upon the Duration of Life? By FREDERICK R. STURGIS, M.D., Assist. Surg. Manhattan Eye and Ear Hospital, N. Y. City.

The Electrolytic Treatment of Cancer. By A. D. ROCKWELL, M.D.

The Treatment of Uterine Flexions. By ELY VAN DE WARKER, M.D. Buffalo, 1874.

Memoir of the late William C. Roberts, M.D., Vice-Pres. of the New York Acad. of Med., etc. By GOUVERNEUR M. SMITH, M.D. New York, 1873.

Electrolysis in the Treatment of Stricture of the Urethra. By ROBERT NEWMAN, M.D. New York, 1874.

A New Apparatus for Extensor Paralysis. By JOHN VAN BIBBER, M.D. New York, 1874.

On the Government of the Retreat for the Insane at Hartford. Hartford, 1874.

Report of the Nova Scotia Hospital for the Insane. Halifax, N. S., 1874.

Report of the Willard Asylum for the Insane, 1873. Albany, 1874.

Report of the State Lunatic Asylum, Utica, N. Y., 1873. Albany, 1874.

Report of the Asylum for the Relief of Persons Deprived of the Use of their Reason. Philadelphia, 1874.

Report of the Supervising Surgeon of the Marine Hospital Service of the United States, July, 1872-June 30, 1873. Washington, 1873.

Report of the Vaccine Department of the New York Dispensary for 1873. By FRANK P. FOSTER, M.D., Director. New York, 1874.

Report of the State Board of Health of Massachusetts. Boston, 1874.

Report of the State Board of Health of Michigan, Sept. 30, 1873. Lansing, 1874.

Annual Report of the Board of Health of the Health Department of the City of New York. New York: D. Appleton & Co., 1873.

Report of Massachusetts Charitable Eye and Ear Infirmary. Boston, 1874.

Annual Report of the Board of Health of the City of Dayton. Dayton, 1874.

Proceedings of American Pharmaceutical Association, 1873. Philadelphia, 1874.

Transactions of Medical Society of District of Columbia. Washington, 1874.

Transactions of Colorado Territorial Medical Society, 1873. Denver, 1874.

Transactions of the Minnesota Medical Society, 1874. St. Paul.

The following Journals have been received in exchange:—

Deutsches Archiv für Klinische Medicin. Heft 1, 2, 3. 1874.

Centralblatt für die Medicinischen Wissenschaften. Nos. 12 to 28, 1874.

Allgemeine Wiener Medizinische Zeitung. Nos. 10 to 23, 1874.

Archiv der Heilkunde, 1874. Zweites heft.

Medizinische Jahrbücher. 1874. 1 Heft.

Giornale Italiano delle Malattie Veneree. Febbraio, Aprile, 1874.

L'Imparziale. Nos. 6, 7, 9, 11, 12, 1874.

O Correio Medico de Lisboa. Nos. 11, 12, 13, 14, 1874.

Lo Sperimentale. Fascic. 2, 3, 4. 1874.

Nordiskt Medicinskt Arkiv Redigeradt af Dr. Azek Key. Sjette Bandet. Första Häftet, 1874

Archives Générales de Médecine. Avril, Mai, Juin, 1874.

Archives de Physiologie Normale et Pathologique. 1874. Nos. 2, 3.

Annales de Dermatologie et de Syphiligraphie. 1873-74, Nos. 3, 4.

Revue des Sciences Médicales en France et de l'Etranger. Avril, 1874.

Revue Scientifique de la France et de l'Etranger. Nos. 36 to 46, 1874.

Gazette Hebdomadaire de Médecine et de Chirurgie. Nos. 11 to 24, 1874.

L'Union Médicale. Nos. 30 to 71, 1874.

Le Mouvement Médical. Nos. 11 to 23, 1874.

La Tribune Médicale, Nos. 290 to 303, 1874.

Le Progrès Médical, Nos. 11 to 20, 1874.

The British and Foreign Medico-Chirurgical Review. April, 1874.

The Lancet. April, May, June, 1874.

The Medical Times and Gazette. April, May, June, 1874.

The British Medical Journal. April, May, June, 1874.

- The London Medical Record. April, May, June, 1874.
 The Practitioner. March, April, May, June, 1874.
 Edinburgh Medical Journal. March, April, June, 1874.
 The Dublin Journal of Medical Science. March, April, 1874.
 Irish Hospital Gazette. April, May, June, 1874.
 The Glasgow Medical Journal. January, April, 1874.
 The Indian Medical Gazette. February, March, April, May, 1874.
 Canada Medical and Surgical Journal. April, May, June, 1874.
 The Canada Lancet. May, June, 1874.
 The Canada Medical Record. March, April, May, 1874.
 L'Union Médicale du Canada. Avril, 1874.
 The Obstetrical Journal of Great Britain and Ireland. With an American Supplement. April, May, June, 1874.
 The Boston Medical and Surgical Journal. April, May, June, 1874.
 The New York Medical Journal. April, May, June, 1874.
 The Medical Record. April, May, June, 1874.
 The American Journal of Insanity. April, 1874.
 The American Journal of Syphilography and Dermatology. April, 1874.
 The American Journal of Obstetrics. May, 1874.
 The Buffalo Medical Journal. March, April, 1874.
 The Philadelphia Medical Times. April, May, June, 1874.
 The Medical and Surgical Reporter. April, May, June, 1874.
 The Cincinnati Lancet and Observer. April, May, June, 1874.
 The Clinic. April, May, June, 1874.
 The American Practitioner. April, May, June, 1874.
 The Medical Examiner. April, May, June, 1874.
 The Chicago Medical Journal. April, May, June, 1874.
 The Indiana Journal of Medicine. March, April, May, June, 1874.
 The Detroit Review of Medicine and Pharmacy. April, May, June, 1874.
 The St. Louis Medical and Surgical Journal. April, May, June, 1874.
 The Missouri Clinical Record, April, May, June, 1874.
 The Northwestern Med. and Surg. Journal. April, May, 1874.
 The Medical Herald. April, May, 1874.
 The Kansas City Medical Journal. March, April, May, June, 1874.
 The Peninsular Journal of Medicine. April, May, June, 1874.
 The Pacific Medical and Surgical Journal. March, April, May, June, 1874.
 The Western Lancet. March, April, May, 1874.
 The Chicago Journal of Nervous and Mental Diseases. April, 1874.
 Virginia Medical Monthly, April, May, June, 1874.
 Charleston Medical Journal and Review. April, 1874.
 The Southern Medical Record. March, April, May, 1874.
 Atlanta Medical and Surgical Journal. April, May, June, 1874.
 The New Orleans Medical and Surgical Journal. May, 1874.
 The Richmond and Louisville Medical Journal. March, April, May, June, 1874.
 The Nashville Journal of Medicine and Surgery. March, April, May, 1874.
 The Sanitarian. April, May, June, 1874.
 The American Journal of Pharmacy. April, May, June, 1874.
 The Druggist's Circular. April, May, June, 1874.
 The American Journal of Science and Arts. April, May, June, 1874.
 The American Naturalist. April, May, June, 1874.
 The American Chemist. April, May, 1874.
 The Boston Journal of Chemistry, April, May, June, 1874.

Communications intended for publication, and books for review, should be sent *free of expense*, directed to ISAAC HAYS, M.D., Editor of the American Journal of the Medical Sciences, care of Mr. Henry C. Lea, Philadelphia. Parcels directed as above, and (carriage paid) under cover, to Mr. Charles J. Skeet, Bookseller, No. 10 King William Street, Charing Cross, London: or M. Hector Bossange, Lib. quai Voltaire, No. 11, Paris, will reach us safely and without delay.

All remittances of money and letters on the *business* of the Journal should be addressed *exclusively* to the publisher, Mr. H. C. Lea, No. 706 Sansom Street.

The advertisement sheet belongs to the business department of the Journal, and all communications for it must be made to the publisher.

CONTENTS

OF THE

AMERICAN JOURNAL

OF THE

MEDICAL SCIENCES.

NO. CXXXV. NEW SERIES.

JULY 1874.

ORIGINAL COMMUNICATIONS.

MEMOIRS AND CASES.

ART.	PAGE
I. Traumatic Neuralgia; Section of Median Nerve. By S. Weir Mitchell, M.D., Member of National Academy of Sciences. (With five wood-cuts.)	17
II. Case of Exsection of the Brachial Plexus of Nerves for the Relief of Painful Neuroma of the Skin. By F. F. Maury, M.D., Surgeon to the Philadelphia Hospital, and Louis A. Duhring, M.D., Clinical Lecturer upon Diseases of the Skin in the University of Pennsylvania. (With a wood-cut.)	29
III. Retinal Hemorrhage and its Connection with Cerebral, Cardiac, and Renal Lesions. By Charles S. Bull, A.M., M.D., Assistant Surgeon to the New York Eye and Ear Infirmary; Microscopist to the Manhattan Eye and Ear Hospital.	37
IV. On Laparotomy, or Abdominal Section, as a Remedy for Intussusception; with Tables showing the Results of the Operation in cases of this Affection, and in those of other forms of Acute Obstruction of the Bowels. By John Ashhurst, Jr., M.D., Surgeon to the Episcopal Hospital, Surgeon to the Children's Hospital, etc.	48
V. On Thrombosis of the Cerebral Veins, and Sinuses of the Dura Mater. (Second paper.) By John A. Lidell, M.D., of New York.	64
VI. On the Value of High Powers in the Diagnosis of Blood Stains. By Joseph G. Richardson, M.D., Lecturer on Pathological Anatomy in the University of Pennsylvania, and Microscopist to the Pennsylvania Hospital. (Read before the Biological and Microscopical Section of the Academy of Natural Sciences, and recommended for publication in the American Journal of the Medical Sciences.)	102
VII. On Transfusion of Blood, with a Report of Eight Cases, and a Description of a Convenient Apparatus for Performing the Mediate Method. By Thomas G. Morton, M.D., one of the Attending Surgeons of the Pennsylvania Hospital; Emeritus Surgeon to Wills (Ophthalmic) Hospital, Philadelphia. (With three wood-cuts.)	110
VIII. Case of Mollities Ossium. By John Neill, M.D., Associate Professor of Clinical Surgery in the Hospital of the University of Pennsylvania.	119

ART.	PAGE
IX. Cases Illustrating the Application of Elastic Ligatures in Surgery. By Stuart Eldridge, M.D., in charge of Imperial School of Medicine, Hakodate, Japan. (With a wood cut.)	126
X. Report of Twenty Cases of Stricture of the Male Urethra, with Treatment. By A. Vanderveer, M.D., of Albany, N. Y. (With a wood-cut.)	129
XI. Cases of Penetrating Wound of the Abdomen and Chest, with Remarks upon the Treatment of such Injuries. By James C. Rea, M.D., Resident Physician to the Episcopal Hospital, Philadelphia.	147
XII. A Case of Lumbar Colotomy for Obstruction of the Rectum by Cancerous Tumours of the Womb. By John H. Packard, M.D., one of the Surgeons to the Episcopal Hospital, Philadelphia.	150
XIII. Alcoholism, Rheumatism, Bromo-iodism, Cerebral Embolism (?), Aphasia, Paralysis; Recovery. By A. F. A. King, M.D., one of the Physicians to Providence Hospital, Washington, D. C., etc.	153
XIV. Case of Fracture of the Neck of the Femur treated by a New Apparatus. By J. C. Bishop, M.D., of Middleport, Ohio. (With a wood-cut.)	155
XV. Description of a Hospital Bed-Elevator and Carriage, designed especially for Surgical Wards. By Thomas G. Morton, M.D., Surgeon to Pennsylvania Hospital, and Emeritus Surgeon to Wills (Ophthalmic) Hospital. (With a wood-cut.)	158
XVI. Sulphate of Zinc in the Treatment of Poisoning by Rhus Toxicodendron and R. Radicans. By Charles H. Humphreys, M.D., of Brandt, Miami Co., Ohio.	160

REVIEWS.

XVII. A Practical Treatise on the Surgical Diseases of the Genito-Urinary Organs, including Syphilis. Designed as a Manual for Students and Practitioners. With Engravings and Cases. By W. H. Van Buren, A.M., M.D., Professor of the Principles of Surgery, with Diseases of the Genito-Urinary System and Clinical Surgery, in Bellevue Hospital Medical College, etc., and E. L. Keyes, A.M., M.D., Professor of Dermatology in Bellevue Hospital Medical College, etc. 8vo. pp. xvi., 672. New York: D. Appleton & Company, 1874.	161
XVIII. A Manual of Toxicology, including the consideration of the Nature, Properties, Effects, and Means of Detection of Poisons, more especially in their Medico-legal Relations. By John J. Reese, M.D., Professor of Medical Jurisprudence and Toxicology in the University of Pennsylvania, etc. 8vo. pp. 507. Philadelphia: J. B. Lippincott & Co., 1874.	173
XIX. A Treatise on Therapeutics, comprising Materia Medica and Toxicology, with especial reference to the application of the physiological action of drugs to clinical medicine. By H. C. Wood, Jr., M.D., Professor of Botany and Clinical Lecturer on Diseases of the Nervous System in the Medical Department of the University of Pennsylvania, etc. 8vo. pp. 578. Philadelphia: J. B. Lippincott & Co., 1874.	181
XX. The Principles and Practice of Medical Jurisprudence. By Alfred Swaine Taylor, M.D., F.R.S., Lecturer on Medical Jurisprudence in Guy's Hospital. Second edition. 2 vols. 8vo., pp. xvi., 723, xii., 672. Philadelphia: Henry C. Lea, 1873.	185

ANALYTICAL AND BIBLIOGRAPHICAL NOTICES.

XXI.—Obstetrical Transactions.

1. Transactions of the Obstetrical Society of London. Vol. XV. For the year 1873. 8vo. pp. lx., 309. London: Longmans, Green & Co., 1874.
2. Proceedings of the Dublin Obstetrical Society. For session 1872-73. 8vo. pp. xvi., 202. Dublin: Fannin & Co., 1873.

ART.	PAGE
XXII. The West Riding Lunatic Asylum Medical Reports. Edited by J. Crichton Browne, M.D., F.R.S.E. Vol. III. 8vo. pp. vi., 349. London: Smith, Elder & Co., 1873.	201
XXIII. Transactions of State Medical Societies.	
1. Transactions of the Indiana State Medical Society, 1873. 8vo. pp. 142.	
2. Transactions of the Medical Association of the State of Alabama, 1873. 8vo. pp. 112.	
3. Transactions of the Colorado Territorial Medical Society. 8vo. pp. 56.	205
XXIV. Reports of State Boards of Health.	
1. Fifth Annual Report of the State Board of Health of Massachusetts. 1874. 8vo. pp. 550. Boston, 1874.	
2. Second Biennial Report of the State Board of Health of California. From 1871 to 1873. 8vo. pp. 235. Sacramento, 1873.	
3. First Annual Report of the State Board of Health of Michigan. For 1873. 8vo. pp. 101. Lansing, 1874.	208
XXV. Third Annual Report of the Board of Health of the Health Department of the City of New York, April 11, 1872, to April 30, 1873. 8vo. pp. 349. New York: D. Appleton & Co., 1873.	215
XXVI. The Toner Lecturers, instituted to Encourage the Discovery of New Truths for the Advancement of Medicine. Lecture I.—On the Structure of Cancerous Tumours, and the Mode in which Adjacent Parts are Invaded. By J. J. Woodward, Assistant Surgeon U. S. A. Delivered March 28, 1873. Washington: Smithsonian Institution. Nov. 1873.	219
XXVII. On the Government of the Retreat for the Insane, at Hartford, Connecticut. Printed for private use. Hartford, Connecticut, 1874.	221
XXVIII. Lectures on the Diseases of Infancy and Childhood. By Charles West, M.D., F.R.C.P., Physician to the Hospital for Sick Children. Fifth American from the Sixth revised and enlarged English edition. 8vo. pp. 678. Philadelphia: Henry C. Lea, 1874.	225
XXIX. Reports of American Hospitals for the Insane.	
1. Pennsylvania Hospital for the Insane.	
2. Western Pennsylvania Hospital.	
3. State Hospital at Danville.	
4. Butler Hospital, Providence, Rhode Island.	
5. Longview Asylum, Ohio.	
6. Northern Lunatic Asylum, Virginia.	
7. Northern Hospital, Oshkosh, Wisconsin.	
8. Willard Asylum, Western New York.	
9. State Lunatic Asylum, Utica, New York.	228
XXX. The Nature of Gunshot Wounds of the Abdomen and their Treatment: based on a Review of the Case of the late James Fisk, Jr., in its Medico-Legal Aspects. By Eugene Peugnet, M.D., etc. 8vo. pp. 96. New York: William Wood & Co., 1874.	233
XXXI. A Universal Formulary; Containing the Methods of Preparing and Administering Official and other Medicines. The whole adapted to Physicians and Pharmaceutists. By R. Eglesfeld Griffith, M.D. Third edition, carefully revised and much enlarged, by John M. Maisch, Phar. D., Professor of Materia Medica and Botany in the Philadelphia College of Pharmacy. With illustrations. 8vo. pp. 779. Philadelphia: Henry C. Lea, 1874.	234

QUARTERLY SUMMARY

OF THE

IMPROVEMENTS AND DISCOVERIES IN THE MEDICAL SCIENCES.

ANATOMY AND PHYSIOLOGY.

PAGE	PAGE
1. Bartholow's Experiments on the Human Brain. By Dr. Ferrier. 235	5. On Diapedesis. By Prof. J. Arnold 239
2. Further Researches on the Localization of Functions in the Brain. By Dr. Ferrier. 236	6. Origin of the Bile-ducts. By Professor Kupffer. 240
3. Neuropathic Origin of Simple Hydruria (Diabetes Insipidus) from Epidemic Cerebro-spinal Meningitis, Trauma, and Syphilis. By Prof. Mosler. 238	7. Contributions on the Structure and Functions of the Bladder. By Dr. G. Jurié. 240
4. Changes in the Muscular Tissue, after Division of Nerves. By Professor Bizzozero and C. Colgi. 239	8. Bladder with a Pouch communicating with a Third Ureter. By Mr. Fletcher Beach. 240
	9. Ovulation without Menstruation. By M. de Sinéty. 240

MATERIA MEDICA, GENERAL THERAPEUTICS, AND PHARMACY.

10. Jaborandi, a new Sudorific and Sialagogue. By Drs. S. Coutinho, Rabuteau, and Gubler. 241	14. Physiological Action of Coca. By Dr. Alex. Bennett. 245
11. On Eucalyptus and its Febrifuge Qualities. By Dr. E. Burdel. 241	15. Importance of the Purity of Chloral Hydrate. By Dr. Oscar Liebreich. 246
12. Action of Chloroform. By Dr. Pollak. 242	16. Ergotin as a Means of Arresting Hemorrhage. By Dr. Drasche. 247
13. Prof. Schiff's Studies on Ether and Chloroform. By Dr. T. G. Hake. 242	17. Active Agent of Ergot. By Dr. A. Wernich. 248
	18. Importance of Salts in Food. By Foster. 248

MEDICAL PATHOLOGY AND THERAPEUTICS, AND PRACTICAL MEDICINE.

19. General Angioleucitis of the Lungs. By Dr. Reynaud. 249	caused by an unusual mode of Lead-Poisoning. By Dr. Althaus. 252
20. Dizziness and its connection with Migraine. By Dr. T. Clifford Allbutt. 249	25. The Local Treatment of Lung Cavities. By Drs. W. Mosler, Pepper, and Hutchinson. 253
21. Albuminuria in Cases of Vascular Bronchocele and Exophthalmos. By Dr. J. Warburton Begbie. 250	26. Employment of Bromide of Potassium as an Auxiliary in the Treatment of Intermittent Fevers. By Dr. Vallin. 256
22. Esophagismus or Spasmodic Closure of the Esophagus. By Dr. A. W. Foot. 250	27. Carbolic Acid in Intermittent Fever. By Surgeon McNally. 257
23. Extension of Melano-sarcoma by Embolism. By Prof. Eborth. 252	28. Hypodermic Injection of Carbolic Acid in Erysipelas. By Dr. Aufrecht. 257
24. Paralysis of the Radial Nerve	

	PAGE		PAGE
29. Guarana in Chronic Rheumatism. By Mr. E. A. Rawson. . .	258	32. Treatment of Eczema, Lupus, and Cancer by Gurjon Oil. By Prof. Erasmus Wilson. . .	259
30. Gelseminum in Odontalgia and Facial Neuralgia. By Dr. J. Sawyer. . .	258	33. Treatment of Leprosy by Gurjon Oil. By Surgeon-Major J. Dougall, M.D.	259
31. Internal Use of Sulphate of Atropia for Profuse Sweating. By Dr. Frantzel.	258		

SURGICAL PATHOLOGY AND THERAPEUTICS, AND OPERATIVE SURGERY.

34. Intravenous Injection of Chloral into the Veins for the Production of Anæsthesia in Surgical Operations and also for the cure of Tetanus. By Profs. Oré, Le Fort, Tilleaux, Verneuil, etc.	260	Breaking Down a False Ligament by Manipulation; Recovery. By Dr. Frederick Betz.	265
35. Tetanus Treated by Chloral Administered by the Mouth. By MM. Chauvel, Verneuil, etc.	262	42. Extirpation of Kidney. By Drs. G. Simon, Brandt, and Stoddard.	266
36. Transfusion. Remarks by Drs. Kuster, Hasse, Sander, and Berns.	263	43. Billroth's Case of Extirpation of the Larynx and Epiglottis; Artificial Vocal Diseases. By Dr. Carl Schwaighofer. . . .	268
37. Cirroid Aneurism treated by Injection of Perchloride of Iron; Death from Embolism. By Mr. J. F. West	263	44. Resection of the Knee. By M. Cherru.	268
38. Ligature of the Femoral Artery for the Cure of Elephantiasis Arabum. By M. Dumarquay.	264	45. Tibio-Calcanean Osteo-Plastic Operation. By J. M. Le Fort.	269
39. Elephantiasis Græcorum. By Dr. Leisrink.	264	46. Fractures of the Skull with Reference to Operative Interference. By Dr. Corley. . . .	269
40. Strangulated Hernia Successfully Treated by Inversion. By Dr. Thornton.	264	47. Treatment of Cystic and Fibrocystic Bronchocele. By Dr. Morell Mackenzie.	270
41. Volvulus Treated by (Extra-Peritoneal) Abdominal Section;		48. The Contra-indications to the Removal of Melanotic Tumours, derived from the Examination of the Blood and the Urine. By M. Nepveu.	271
		49. Extirpation of the Spleen. By Dr. Watson.	271

OPHTHALMOLOGY.

50. Derangements of Vision and their Relation to Migraine. By Dr. T. Clifford Allbutt. . . .	272	ously to Operation. By Mr. Critchett.	273
51. Transitory Embolism of the Central Artery of the Retina. By Dr. L. Mauthner.	273	53. Prolapse of the Vitreous Humour. By Mr. Pierné.	274
52. Treatment of Cataract previ-		54. Foreign Bodies lodged within the Eye. By Mr. C. S. Jeaffreson.	274
		55. Tubercular Ulceration of the Conjunctiva. By Dr. H. Stattler.	276

MIDWIFERY AND GYNÆCOLOGY.

56. Twin Pregnancy in a Double Uterus. By Dr. Perrault. . . .	277	the Interior of the Uterus. By Dr. A. H. Ringland.	279
57. Spurious Pregnancy with Labour. By Dr. Underhill.	277	59. Use of the Chloride of Iron in Post-partum Hemorrhage. By Dr. Lombe Atthill.	281
58. Post-partum Hemorrhage treated by the Application of the Solid Perchloride of Iron to		60. Fatal Result of Injection into the Vagina. By M. Lorain. . .	282

	PAGE		PAGE
61. Syphilis communicated by the Finger of a Midwife. By M. Bardinet.	282	63. On the Local Treatment of Gangrenous Vulvitis in Young Girls by Iodoform Powder. By M. Parrot.	284
62. Comparison between Hyster- otomy and Ovariectomy. By M. Richet.	283	64. The Danger of Intra-Uterine Injections.	284

AMERICAN INTELLIGENCE.

ORIGINAL COMMUNICATIONS.

Addendum to Art. IV. On Lapa- rotomy as a Remedy in Cases of Intussusception, etc. By John Ashhurst, Jr., M.D., etc.	285	Podophyllin for Acute Rheuma- tism. By R. F. Dyer, M.D.	286
Epistaxis successfully Treated by		Injections of Diluted Solution of the Sulphate of Iron. By Frank- lin N. Staub, M.D.	285

DOMESTIC SUMMARY.

Traumatic Aneurism of Neck, Li- gation of Left Common Carotid, with Permanent Silver Wire Ligature. By Dr. R. W. Gibbes.	286	Respiration, and Temperature of Puerperal Women. By Dr. G. Wilds Linn.	289
On the Spectrum of Bile. By Dr. J. C. Dalton.	287	Hydro-chloral by the Rectum in the Vomiting of Pregnancy. By Dr. D. B. Simmons.	290
Treatment of Uterine Fibroid by Hypodermic Injections of Ergo- tine. By Drs. Theophilus Par- vin, A. Reeves Jackson, J. H. Etheridge, H. P. Merriman, and S. Fisher.	288	Drainage in Obstinate Chronic In- flammation of the Bladder. By Dr. Hunter McGuire.	290
Inversion of Uterus; Prompt Re- placement. By Dr. G. W. H. Kemper.	288	Restraint of Hemorrhage during Operation in the Mouth. By Prof. E. Andrews.	290
Report on the Ovaries removed by Dr. Thomas. By Dr. Noegge- rath.	289	Surgical Treatment of Naso-phar- yngeal Polypi. By Dr. David W. Cheever.	291
Bromide of Ammonium in Cata- menial Excesses. By Dr. J. K. Black.	289	The Influence of Anæsthetics on the Vaso-motor Centres. By Dr. H. P. Bowditch and Charles S. Minot.	291
Observations on the Normal Pulse,		Modification of Trommer's Test for Sugar. By Dr. George B. Fowler.	291

THE
AMERICAN JOURNAL
OF THE MEDICAL SCIENCES
FOR JULY 1874.

ART. I.—*Traumatic Neuralgia; Section of Median Nerve.* By S.
WEIR MITCHELL, M.D., Member of the National Academy of Sciences.
(With five wood-cuts.)

Miss T. at the age of two and a half years ran a splinter into the palm of the right hand over the point at which the median nerve divides in order to send branches to the thumb and fingers. The fragment, which came from a barrel hoop, was said to have been, when it entered, a third larger than when taken away twenty years after. It passed so deeply into the hand that it was thought best to poultice the part and encourage suppuration before removing the foreign body. To the physician's surprise the wound healed rapidly, every sign of irritation passed away, and the child soon after was taken from this city, in which the accident took place.

The piece of wood could always be felt distinctly in the palm, but only once, when in Panama, at the age of twelve, was its presence in the least degree annoying. When 22 years old, Miss T., then in Naples, caught hastily the falling top of a trunk, and in so doing bruised the region in which lay the splinter. Great local pain and slight swelling followed, but, growing better in a few days, left her with some uneasiness and discomfort in the part struck. After three months she began to have pain in the right shoulder, for which Dr. Suchet, of Paris, ordered liniments, regarding it as rheumatic. In May of the same spring of 1871, the pain in the hand grew worse, and in July it was severe in the median palm, thumb, and palmar face of the index-finger. At Plombières, in August, and later while travelling, it increased, and extending to the forearm assumed throughout a hyperæsthetic character, so that she began to guard the parts from foreign touch. It now became plain that the trouble was due to the splinter, and accordingly, at Milan, October 22, 1871, Dr. Sapolini, Surgeon to the King of Italy, assisted by Dr. Guerini, after a careful search removed the splinter, which is said to have lessened in size, is certainly smoother than it could have been at first when twenty years before it entered her palm. Dr. Sapolini, whom I had the pleasure to meet in Milan last summer, told me that it lay among the diverging median nerve filaments, and was taken away with great difficulty. On awaking from the chloroform sleep, she was at once conscious of intense

pain in the fore-finger and thumb. Within a few days the fingers contracted in firm flexion, the pain became exquisite, a touch was torture, and the median palm from time to time swelled and throbbed so as to induce the belief that pus had formed. Under poultices it would, however, subside, and in a few days go through the same process anew. The wound healed in a month, but thenceforward she lived under the influence of morphia, being almost entirely sleepless from the incessant pain and exquisite hyperalgesia which made the lightest contact a thing to be guarded against by precautions which seemed almost absurd. Despite the pain, a successful effort was made to straighten the fingers by the aid of a dorsal splint, and on its removal they remained straight or extended. The torment was worst on the thumb, median half of face of forefinger, the annulus, and the median palm close to the forefinger. It also extended on to the back of the hand, where it affected the dorsal surface on the radial side of the hand, and especially the last two phalanges of the second and third digits where the pain was no less than in front. Throughout all the regions named it was a constant burning pain, with red and smooth surfaces upon which the fall of a bit of lace or a veil edge was simply anguish.

In this condition Miss T. went from one well-known physician to another, the pain passing up the forearm and involving its whole surface in a hyperalgesia which varied in degree and was accompanied with a disturbance of the local circulation in the limb, so that it was now intensely flushed and now pale in spots. The shoulder also continued to be painful, and associated neuralgias awoke in the right face and neck and even in the right foot.

The whole range of usual local and general therapeutic means failed to lessen her pain, although heat, cold, actual cautery, Vienna paste, hypodermic injections of morphia, blisters, electricity (induced currents) were employed in turn, with an endless list of others which I need not catalogue. At length, in November, 1871, Dr. Sapolini found, after the most careful study, that, while protracted pressure on the median nerve in the forearm caused only an increase of pain, pressure on the musculo-spiral, at first increased and by and by destroyed not only the pain but the sensitiveness so completely that the finger and thumb could be roughly handled both on their dorsal and palmar faces. Again and again he applied this test, and when fully convinced that he was not mistaken and that relief always followed the pressure, he cut down on the musculo-spiral nerve above the outer side of the elbow and removed an inch of it. Absolute ease at once followed this section, pain and sensitiveness alike disappearing, while, to the amazement of the skilful anatomist who operated, the loss of touch in the radial regions of the back of the hand was so slight that he doubted there being any loss, although a considerable amount of wasting in the extensors and an absolute wrist-drop showed that the muscular distribution of the nerve had suffered. The full extent of this loss I have not learned. It left for a time a hollow in the forearm, but within a few months (four or five) the arm regained its plumpness, and as to the lack of power in the extensors it was certainly slight in the spring of 1873, although at this time the pain was enough to so far inhibit movement as to make it no easy task to judge of the real amount of motility. As to the sense of touch being but slightly hurt anywhere in the hand by the section of the musculo-spiral, I have also the assurance of Miss T., whose curiosity led her to examine the part with care.

On the eighth day after the operation the pain suddenly returned. The

sensitiveness to touch remained somewhat lessened on the back of the fingers and thumb, and on the whole the torture was thereafter less extreme, but it was still terrible, and the associated sensations grew worse, so that, as I have many times seen in other cases, the whole skin grew irritable and the sources of torment multiplying, bright lights and sharp sounds increased the pain, sensitive spots were developed on the scalp, a thick crop of herpetic eruptions covered the right arm, neck, and face, while the general health began to fail despite the most careful and skilful efforts to sustain it. Something was due no doubt to the prolonged healing of the wound, which was interfered with by frequent abscesses, and at last at the third week by erysipelas.

After the failure to gain full relief from Dr. Sapolini's well-considered operation, Miss T. consulted very many surgeons and physicians of distinction, but without obtaining any further good result. In August, 1872, after using by Sir James Paget's direction a long series of hot water arm-baths, Miss T., by his advice, returned to America. In January, 1873, I saw her in New York, and in the middle of February she placed herself under my care in Philadelphia, where, with the kind aid of my friend Dr. Wm. W. Keen, I made the following notes of her case.

At this time, with no notable functional trouble, Miss T. was thin and weak and singularly liable to sudden flushes or as sudden pallor. She slept with the hand propped upon its ulnar edge, and awakened many times at night when it fell over or was touched by the bedclothes, while all day long she devoted herself to the task of shielding the part from every foreign contact. This anxiety to avoid having the hand touched, and the constant influence of pain, gave to her physiognomy a singular expression of suffering and vigilance, such as I have rarely seen since the terrible traumatic neuralgias of the late war.

The arm presented numerous marks due to the use of cauteries, and on the palm at the edge of the thenar eminence was the scar of the operation for removal of the splinter, and above the elbow was the cicatrix left by that of the nerve section.

Motility.—Miss T. can use the deltoid, and flex and extend the arm, but, if the movement be sudden or extreme, it causes pain in the shoulder and neck. She can slowly and with pain pronate and supinate the forearm. She cannot extend the wrist, but on its being extended can delay its fall, chiefly by using the radial extensors. Slight power to flex wrist. The first and second fingers have no motility; but she can stir the last joints of the other fingers in flexion and extension. Probably most of this lack of power is due to long disuse and the inhibitory power of constant pain. The future history proved this view to have been correct.

Sensation.—This was examined by nerve regions. Touch and power to localize or place a touch are normal in the musculo-cutaneous distribution. Touch is well felt above scar left over the point of section of the musculo-spiral. Touch just below the scar is badly felt, and is referred above the scar. The radial and median sensation in the arm is normal, as well as that of the internal cutaneous nerve. In the radial area on the back of the thumb and first and second fingers touch is referred correctly, and is everywhere felt; but throughout this region every touch is felt as both touch and pain. In a less degree this is true of certain parts of the whole arm, and most notably of parts just around the scar of the operation on the musculo-spiral. The ulnar territory is in all respects healthy by compass points. The sensitiveness of the thenar eminence is not acute, but increases as we approach the index-finger. The hyperalgesia is exquisite in the face of the second

finger, and the radial side of the third finger; on the face of the thumb and the palm; over the first joint of the index. In these regions touch is so much more distinctively felt as pain that the degree of health of the power of touch cannot be thoroughly studied. The over-sensitiveness is worst in parts of the median and radial territory of the hand, better in the external cutaneous branches of the musculo-spiral, and normal in the ulnar and internal cutaneous.

The great nerve tracks are tender upon deep pressure, which, over the median and musculo-spiral above the scar, causes increased pain in the hand. The axillary and brachial plexus are also tender, as well as the three upper cervical vertebræ. At times the surface of the right chest is sore, and also the teeth of the right side of both jaws, the teeth being themselves sound.

Secretions.—The median palm sweats incessantly, and the odour of the perspiration is very acid and heavy.

Nutrition.—The measurements of the two arms are as follows:—

Left forearm	8 $\frac{3}{4}$ inches
Right “	8 “
Left arm biceps	9 $\frac{5}{8}$ “
Right “	8 “

There is at this date no especial wasting of any of the forearm muscles, and no remarkable want of muscular tone. The interosseal groups are not wasted.

The two little finger nails are normal and alike, the second finger and thumb nails on the right hand are curved laterally, that is, singularly arched. The right index nail is $\frac{5}{16}$ inch broad, that of the left $\frac{7}{16}$ inch. She thinks there has been no difference in the rate of growth. The general tint of the right hand is livid, and the arm is liable to sudden alternations of feeling as to temperature, while the slightest irritation causes at first intense paleness followed by definitely limited islands of deeply flushed skin. The skin of the thumb and index-finger is rough, ragged, and marked with yellowish patches of loosened epithelium.

Temperature.—I made, at this time, an effort to ascertain the temperature of the affected parts, but totally failed, owing to the sensitiveness of the surface being such as to forbid the mere touch of the instruments.

Galvanism.—The forearm and hand muscles all reacted rather feebly under induced currents, but this was possibly due in some degree to long inaction, and she could not endure a severe use of the battery. The effects of galvanism were most interesting, and such as at first to induce me to believe that the constant current might prove of curative value. A current of at least ten cells in *either direction* along the track of the median nerve rendered the fingers nearly altogether free from over-sensitiveness, and enabled me, while the current passed, to ascertain that the sense of touch in these parts was but slightly impaired. This experiment was made again and again with the same result, and satisfied me that the nerve could not be very gravely altered. I am not aware of any like observation elsewhere recorded. I may add that the influence was limited to the median, and that continued galvanic treatment failed to relieve, except at the moment, and this is in accordance with all my former experience of traumatic neuralgia.

A long and careful study at last satisfied me that the cause of trouble lay in the disordered filaments of the median nerve in the hand, and that the effects exterior to this part were probably due to disturbances of the sensorium, propagated from the hand and resulting in associated neuralgias,

such as are commonly but inaptly termed reflex. One question remained to be answered, How far up the median nerve had the organic changes travelled. To this I could give no positive reply, since the whole nerve was tender, and there might possibly be a sclerotic condition of the entire nerve up to its spinal origin; but in this case I should have expected to find the muscles less sensitive to induced currents and the tactile sense greatly disturbed, which was not the case; I therefore determined to take the risk and divide the median nerve. At this stage Dr Brinton saw the case, and, in consultation with Dr. Keen, we determined to operate on the forearm below the point at which the motor filaments are given off to the forearm muscles. The only loss would thus be the sensibility of the median territory in the hand and the mobility of certain thumb and interosseal muscles. I add here Dr. Brinton's account of the operation, which was done by him with the assistance of Drs. W. W. Keen and Wharton Sinkler.

"March 2d, 1873, I first ascertained precisely the margins of the flexor carpi radialis and palmaris longus muscles by extending the hand upon the forearm. I then made an oblique incision $2\frac{1}{2}$ inches long, from over the border of the first to that of the last-named muscle; the lower end of this incision terminated two inches above the line of the wrist-joint.

"The superficial fascia and the muscular aponeurosis were next divided on a director in the line of the cut. The tendinous edge of the radial flexor and the narrow tendon of the palmaris were thus exposed to view. I then sought for the median nerve in the inter-muscular space, and uncovered it at the lower end of the cut, just at the point at which it emerges from beneath the oblique fleshy fibres of the flexor sublimis digitorum; with the end of the finger this muscle was then raised from its bed (without laceration of its fibres) as high as the upper end of the incision. The median nerve was thus completely exposed for an extent of $2\frac{1}{2}$ inches.

"It was decided by Dr. Mitchell that the removal of three-quarters of an inch of the nerve would be sufficient for the object of the operation; and this length of nerve was accordingly excised with the scissors. It was at the same time suggested, that, to diminish the probabilities of reunion of the divided nerve ends by fresh nerve development, the lower exposed end of the nerve trunks should be turned in a transverse direction into the surrounding tissues and there fixed. This was accordingly done, the nerve end being retained in its new position by a wire suture, which was removed at the expiration of forty-eight hours.

"The portion of nerve thus excised commenced below the origin of the muscular and anterior interosseous branches, and terminated above the origin of the palmar cutaneous branch. There was no bleeding; and no ligatures were required. The wound healed in about ten days."

The nerve ends retracted at once to such an extent that, although but three-quarters of an inch were taken away, the separation was found to be an inch and a half, and this became fully two inches and a quarter, when, at my suggestion, the lower end of the nerve was doubled on itself. The nerve looked healthy; and the piece put in Muller's fluid was studied within a few hours by Dr. Bertolet, whose statement I append. A hypodermic injection of morphia was given; this drug caused alarming prostration, while chloral produced the wildest excitement. The wound was painful; and on the third day, in this, as in Dr. Sapolini's operation,

erysipelas came on. It involved the lips of the wound first and thence journeyed to the finger tips and up the arm and over the right side of the chest. During this period of eight days I tried and gave up in turn many forms of narcotics. From this time the case progressed favourably, needing no treatment save tonics and a bountiful diet. A few hours after the operation I made an examination of the limb as well as the pain in it permitted, and found that the palmar face of the thumb and index were insensible, and could be touched without any annoyance, but hyperæsthesia still existed in the radial territory. On the sixth day there were acute pains in the index and thumb, due, I suppose, to the changes in the centric end of the cut nerve. On the sixteenth the hand and arm admitted of a careful study, and we found the following condition :—

Motion.—The relief from pain enabled her to move all the muscles save those damaged by the section of the nerve. The flexor tendons tied fast by the cicatrization of the wound, yielded to carefully conducted passive motion, and we shortly learned that the extensors and flexors were in nearly equally good order, but that in the thumb and index there were subacute joint lesions, which promised for a time to limit the range of motion. The section of the median nerve disturbed no muscles save those of the thenar eminence and the median interosseal groups; but as one of the short adductors of the thumb is fed by the ulnar nerve, there yet remained the power to approximate the thumb and fingers.

Sensation was absolutely lost for *touch* and *pain* on the palmar face of the thumb, index, and up to an irregular line on the radial side of the centre of the same face of the third finger. It was not lost on the palm though slightly lessened, but was absent on a part of the dorsal ends of the second and third fingers. Beyond these regions, as I shall further describe, touch was dulled over a much wider range. The area of absolute loss of feeling is seen at a glance in the accompanying diagram. It was traced again and again with the most sedulous care, and each time recorded on diagrams which were found to agree. With no less care I studied the sensory condition of the radial region. At first it presented the hyperæsthesia which had never left it since eight days after the operation on the musculo-spiral, but from the date of section of the median this very rapidly lessened, and within a month was but trifling. The sense of touch in this region was perfect.

The associated neuralgias and the tenderness of the nerves faded with equal rapidity, and thus within ten days, except the relics of radial sensitiveness, there was absolute freedom from every form of pain.

Nutrition.—The acneous eruption passed away with the pain, and a marked and steady change for the better took place in the colour and vascular state of the limb.

All the nails of both hands were stained on the day of the nerve section. Those of the left grew steadily at the rate of about 1 mm. a week. *None* of the nails on the right hand grew until the 14th day, when all grew at equal rates.

Temperature.—The sensitiveness before the operation, and the erysipelas after it, unfortunately interfered with my earlier thermal studies.

14th day. No erysipelas, wound healed.

10 A.M.	Right median region	.	.	.	.	.	.	96.5
	Left " "	.	.	.	.	.	.	91.5
9 P.M.	Right " "	.	.	.	.	.	.	96.4
	Left " "	.	.	.	.	.	.	92.5

16th day. Erysipelas again appeared on the right shoulder, but faded in two or three days after a fevered and restless night.

Right median thumb	92.4
Left " "	95.3

19th day. Patient well.

5 P.M. on 1st joint of index ; Right median nerve region .	97.6
Left " " " .	94.

23d day.

Ball of thumb ; Right median nerve region.	93
Left " " "	92
Right index	93.5
Left "	90

A few days later I awakened a subacute arthritis in the metacarpophalangeal articulation of the right forefinger by making too extreme movement. The trouble proved obstinate, and exacted long rest on a splint with repeated counter-irritation by strong solutions of nitrate of silver ; but this was the sole drawback, and ever since the hand has continued to improve in motion, while there remains the most absolute freedom from pain.

On the 20th Nov. 1873, ten months after the operation, Miss T. came to Philadelphia again, and gave me a chance to study the peculiarities of her condition at this time.

The forearm muscles *all* responded readily to moderate faradic currents. The essential thumb muscles in the thenar eminence moved under no form of electric stimulus, faradic or galvanic, save the short ulnar adductor, which being fed by the ulnar nerve responded to both currents. The ulnar interossei acted well ; the median hand muscles of like groups did not respond to any electric irritation.

Sensation.—The study of the sensations proved very interesting. I give the simple details, reserving my comments.

The diagrams of lost touch and pain, made within a month after the section, remain much the same, except that on the median side of the third finger, first and half of second phalanx, touch can now be dully felt. The area of the palm in which touch was marked as lessened, is much as at that date ; perhaps has somewhat bettered.

The dorsal regions of lost pain and touch remain as in the diagram, except that on the outside of the thumb there seems to have been some gain.

The ulnar half of the third finger palmar face feels light touch throughout, and correctly refers it, but is incapable of discerning as two the compass points at any distance apart. To my surprise the radial half of the fourth finger, though feeling a touch everywhere, is also unable to discern compass points as two at any distance apart. The ulnar side of the palmar face of this finger is more sensitive near the end ; last phalanx the points are felt as two at $\frac{3}{8}$ of an inch apart ; on the sound side as two at $\frac{1}{8}$ of an inch asunder. The fifth finger gives the same response on both sides of the body, but the patient insists that there is a difference in feeling in favour of the sound side.

There is absolute freedom from pain.

The nails grow alike. The thumb muscles are atrophied.

Remarks.—The trouble in this case began when the point where the splinter lay was struck. It is difficult to say what was the nature of the process then set up, but it was certainly irritative in character, and was

suddenly made worse by the operation in which the foreign body was removed. The hyperæsthesia and burning pain, and the contraction of the fingers make it probable that the trouble was inflammatory. The after-consequences were most interesting and instructive. The phenomena of pain and hyperalgesia, at first limited to the median nerve, as usual began to bring about in the sensorium a state of morbid irritability in closely related groups of ganglionic nerve cells, so that the musculo-spiral was next affected, and this, as I have said, through the sensorium; next other centres felt the same influence, and the irritative radiations inward from the diseased median so morbidly altered other and remoter sensation centres, as to cause these also to express pain, and thus to give rise to associated neuralgias of the shoulder, neck, face, and leg, the influence being throughout purely unilateral. When the nerve was divided, the centres were at once relieved from this steady afflux of morbid impressions, and rapidly regained their healthy states, with the exception of those from which arises the musculo-spiral nerve, the radial filaments of which still remain slightly over-sensitive, but are also improving.

In many cases I have traced these associated sensations to a passage upwards of the condition of neuritis or sclerosis, which came at last to invade other nerves of the parent plexus. At present, I believe that I should incline to charge a greater number of these secondary neuralgic and other changes to this singular condition of the centres of sensation, which, under the influence of constant irritation, propagates, from one set of ganglia to another, a growing tendency to evolve pain and other phenomena in the nutritive sphere. We have thus developed at last in the sensory centres a state which elsewhere I have described as being the exact analogue of what strychnia causes in the motor centres. Given such a state of things, and the sensory centres not only feel as pain influences which are not usually productive of pain, but also within themselves originate, as it were spontaneously without new irritations from without, the condition called pain. As yet we know of no drug which can bring about this state of the sensory ganglia, as strychnia causes a like state of the motor organs.

The ease for a time given in all the nerve regions involved by Dr. Sapolini's section of the musculo-spiral must, as I think, have been due to some influence which it exerted on and through the related groups of nerve centres.

In facial neuralgias not traumatic, I have frequently observed that the fits of pain in the infra-orbital could be temporarily bettered or checked by pressing upon the supra-orbital, or that pain in the infra-maxillary could be controlled by hard pressure on the supra-orbital. Sometimes, as I saw to-day in a neuralgia of the jaw in a toothless man, the slightest pressure anywhere on the gum will relieve the pain which talking or swallowing evolves. A sudden impression thus made at any point more remote might

effect a like object. Thus, I am sure that I have seen pain in the brow disappear for days on the removal of a sound tooth, which was not really the agent in creating the pain, and I am disposed to explain thus many of the reliefs or cures of neuralgia by pulling teeth.

Section of the musculo-spiral is said, by Dr. Sapolini, not to have destroyed the sense of touch or pain anywhere in the radial territory of the hand, and if the patient and the operator were not deceived, this is to be attributed to the remarkable manner in which the nerves run over into the territories of their neighbours, and possibly to some variation in the normal supply. The part in question remained unaffected as to feeling by section of the median, so that the repair made *ad interim* must have been very complete.

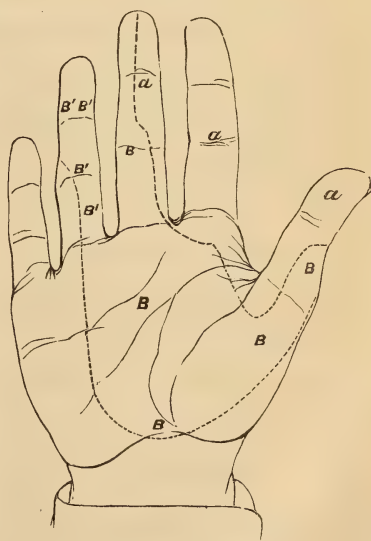
The usual muscular distribution of the radial to the extensors certainly suffered, but as there is to-day full power, and as the early and marked atrophy has passed away, I conclude that the lost inch of the musculo-spiral has been restored most remarkably. Errors as to sensation may readily be made, but surely none could be as to the palsy and atrophy of the extensors, while also it is well to remember, that although the hand nerves run over, as it were, into one another's territories, the muscles are more constantly supplied by single nerves, and have a far less irregular distribution.

In studying the areas of lost sensation in this most valuable case, I shall first consider the case of touch. Fourteen days after the operation it was as shown in Diagrams 1 and 2. In November, 1873, it had changed but

Fig. 1.



Fig. 2.



a. Pain and touch lost. B. Touch lessened. B'. Touch slightly lessened.

little on the dorsal aspect, while on the palmar face it had altered somewhat, so that, in certain portions of the thumb and third finger, a touch was felt in November where in February it was not.

Perhaps it may be said that the local shock may have been the partial cause of the more complete loss in February, but the change was slight. Something may be due to the greater attention paid to the region of dulled sensation, owing to which the sensorium became trained up to the perception of impressions which at a former period could not be felt at all. The loss of touch and pain was entire in the regions marked.

In a part of the palm, as indicated, pain was not notably less, and touch was slightly lessened, as measured by compass, for in all of the palm marked B, the lightest impact was felt. So also of the touch in the third digit, ulnar side, and all of the face of the fourth. These facts are of interest because the region of the greatest loss, dorsal and palmar, by no means corresponds to the anatomical descriptions and drawings, which either allow us to suppose the distribution to be symmetrical, or delineate it in diagrammatic lines which do not correspond either to the results in this case or in others. The innervation beyond the radial side of the third finger is also seen to be disproportionately small.

In Miss T.'s case there is, too, some loss of function in the ulnar side of the fourth finger for which we are hardly prepared by the usual descriptions.

I had hoped to learn, from this case, whether nail growth is checked by nerve section. Unluckily the facts prove too much, since neither in the ulnar, radial, nor median territories did they grow for some time. Moreover, the presence of erysipelas may have influenced the nail growth.

As to thermal conditions, the laboratory and the clinic have seemed to be at variance. In my recent book I pointed out the fact that the physiological nerve-sections show a rise of temperature, and that the surgical sections show a fall. I also stated that this was probably due to the surgeon's not having made early studies of temperature and to those of the laboratory having immediately followed nerve division. I ventured to predict that the heat would be found to rise after clinical section, and to fall when some weeks had elapsed. This was the case in Miss T., although in the text I have not stated the latter fact. The heat rose remarkably, and continued high with some variations for a month. When I saw her anew, after ten months, it had fallen in the thumb and forefinger two degrees below the temperature of the sound side.

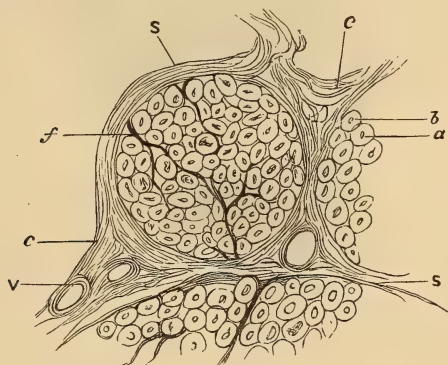
I append the notes of microscopic appearances kindly made for me by Dr. Bertolet.

Macroscopically, the excised portion of median nerve did not present any alterations beyond the loss of the usual pearly-white or glistening appearance. The connective tissue surrounding the nerve did not seem to the naked eye to be materially increased or hardened, the nerve-cord remaining soft and pliable. The nerve was hardened for section by being allowed to remain for several

weeks in a dilute solution of chromic acid. The whole nerve was then imbedded in wax, and transverse cuts made; these were then stained in Tiersch's neutral carmine solution; the water was then abstracted by placing the cuts successively in alcohol and absolute alcohol. They were finally rendered transparent in the oil of cloves, and permanently mounted in Damar varnish.

For the sake of comparison and in order that the description of the alterations presented might be readily understood, we have given in Fig. 3 the micro-

Fig. 3.



Cross-cut of Fasciculi of a Normal Radial Nerve.—*a.* Dark spot representing the axis-cylinder surrounded by the hyaline mass or white substance of Schwann. *b.* Medullary sheath or membrane of Schwann. *s.* Sheaths of the secondary fasciculi. *f.* Trabeculae of connective tissue subdividing the fasciculus. *c.* Loose connective tissues in which are seen, *v.* sections of the bloodvessels.

scopic appearances presented by a normal radial nerve in the cross-cut when prepared precisely by the same method. In the cross-section each individual nerve-fibre exhibits an external ring with double contour, the cut edge of the medullary sheath, nearly in the centre of each circle is seen a dark spot, which is readily stained by carmine; this constitutes the axis-cylinder. The space between the axis-cylinder and the outer circle is filled up with a hyaline mass, known as myeline or the white substance of Schwann. Septa of connective tissue, as shown in the figure, stretch inwards from the investing sheath or neurilemma of the nerve-trunk and divide it into a greater or less number of secondary nerve-bundles or fasciculi. In the cross-section these septa are seen as thick rings, which are united among themselves by more or less loose connective tissue *c*; in the latter are seen coursing the bloodvessels supplying the nerve *d*. The fasciculi are further subdivided by delicate fibres or trabeculae of connective tissue which spring from the sheaths of the secondary fasciculi.

Fig. 4 represents the microscopic appearances presented by the cross-cut of the excised median nerve; the same magnifying powers (180 diameters) being employed as in the preceding figure. It will be seen that the connective tissue of the sheathing of the fasciculi as well as the interfascicular trabeculae are slightly increased in thickness and quantity, though not to that degree which marks the hypertrophy attending chronic neuritis. The sheaths of the fasciculi have no longer the distinct fibrillated appearance of the first prepa-

ration, but merge into the connective tissue in the vacuity. The individual nerve-fibres themselves, however, present the principal changes. In very few of the rings of the secondary fasciculi, even with the higher powers (*vide* Fig. 5),

Fig. 4.

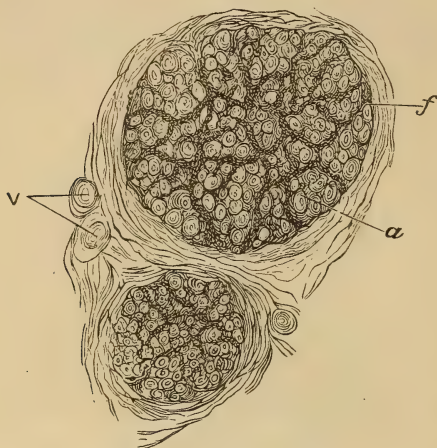
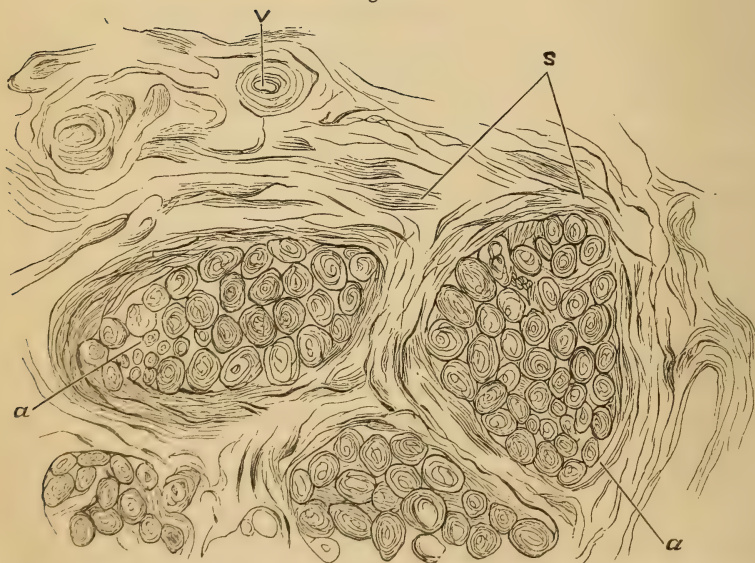


Fig. 5.



FIGS. 4 AND 5. *Cross-cut of Fasciculi of the Median Nerve, exhibiting the Lesions of the Wallerian Degeneration.*—*a*. Confused outlines of the nerve-fibres, concentric arrangement within the circles; scarcely any axis-cylinder to be seen. *s*. Sheaths of the fasciculi. *t*. Trabeculae of connective tissue, moderately thickened. *v*. Bloodvessels, unaltered.

can the axis-cylinder be satisfactorily recognized, nor is it stained by the carmine. The circles of the individual nerve-fibres are no longer clearly de-

finer; they are seen as a confused mass of concentric rings. The myeline is more highly refractive than usual; fresh sections of the nerve, made shortly after its removal, afford a decided play of colours under the polariscope; this property, however, has been destroyed by the process of hardening and mounting employed. Longitudinal sections of the altered nerve revealed a slight increase of the nuclei in the sheaths of Schwann; the latter were no longer homogeneous, but granular and coarsely striated.

The lesions presented in this specimen are those known as Wallerian degeneration; the disintegration and atrophy occurring primarily in the nerve-fibres themselves, while in chronic hyperplastic neuritis the disintegration and atrophy result from the pathological changes occurring primarily in connective tissue framework supporting the nerve-fibres.

ART. II.—*Case of Exsection of the Brachial Plexus of Nerves for the Relief of Painful Neuroma of the Skin.* By F. F. MAURY, M.D., Surgeon to the Philadelphia Hospital, and LOUIS A. DUHRING, M.D., Clinical Lecturer upon Diseases of the Skin in the University of Pennsylvania. (With a wood-cut.)

UNDER the name of Painful Neuroma of the Skin, one of us (Dr. Duhring) reported in this Journal for October, 1873, a case remarkable for its many peculiarities. In that report the subject was discussed from a dermatological point of view only; in the present communication the question will be considered in its surgical aspect, as to the means of affording relief to the excruciating sufferings of the patient.

When first described, the case was deemed to be a unique example of disease, and, after further investigation, there appears to be no reason to question the accuracy of that belief. It seems to stand alone in literature, with its distinctive symptoms, apart from all other cases to which, at first glance, it might be likened. To thoroughly comprehend the affection it is essential that its whole course be carefully investigated in all its details; for, without accurate study of the various symptoms, viewed subjectively as well as objectively, it is impossible to arrive at a just appreciation of its nature. In the number of this Journal just referred to will be found an accurate representation of the disease, as well as certain statements which should be borne in mind.

In addition to the remedies already stated to have been tried, electricity and galvanism have been used perseveringly with no perceptible amelioration of the symptoms. Quinia has also been administered, both in tonic as well as in larger anti-periodic doses, without benefit. Preparations of iron and arsenic, various quantities of the bromide and iodide of potassium, all have been administered in turn without effect.

The signal failure of all remedies, both constitutional and topical, led to the consideration of the propriety of resorting to a surgical operation for the relief of the unbearable suffering which the patient endured. It was thought that by this means only was there a chance of affording any relief. The question presented itself: What operation could be performed with this end in view? It will be remembered that the area of suffering extended over the shoulder, radiating to a certain extent to the integument of the thorax anteriorly, and posteriorly to the scapular region, and down the entire arm, the central seat of pain being upon the arm at a point corresponding to the insertion of the deltoid muscle. It will be seen that a very large tract of surface was thus involved. After a careful study of the distribution of nerves to these regions, in which Dr. S. Weir Mitchell rendered valuable assistance, it was evident that to afford the best chance of subsequent immunity from suffering, it would be necessary to divide the entire brachial plexus of nerves; or better, to exsect a sufficient portion of nerve tissue to preclude any likelihood of reunion. It will be recalled to memory that the fourth, fifth, sixth, seventh, and eighth cervical nerves, together with the first dorsal, combine to form the plexus, these uniting by two main trunks or cords. During this investigation it was also found that the third cervical nerve supplied a portion of the integument of the neck and shoulder posteriorly; but it was seen to be entirely impracticable to divide this nerve by the same operation that would reach the brachial plexus at its most eligible and desirable point. It may be mentioned here that the only recorded case for which any operation has been instituted for a kindred, but not like disease, is that of Drs. Sands and Seguin, of New York, carefully reported in the *Archives of Scientific and Practical Medicine*, No. 1, 1873. The operation in this case, however, was done for a traumatic neuritis.

The free consent of the patient was obtained, after a clear and truthful statement of the risks and dangers had been made, and the operation determined upon.

On the 25th October, 1873, the patient was placed under careful surveillance, and the following notes recorded:—

7 A. M. Patient had three paroxysms during the night, and one after dressing this morning. They each continued from ten to fifteen minutes. 5 P. M. Has had six paroxysms since this morning's note, two of which lasted thirty minutes, two fifteen minutes, and the remaining two eight and ten minutes. Patient is fearful that the proposed operation will be of no benefit to him; nevertheless, is willing to risk death rather than continue to suffer.

26th, 8 A. M. Had three paroxysms through the night, one of which was very severe, and continued one hour; the others lasted each twenty minutes. 5½ P. M. Had two paroxysms to-day, fifteen and thirty minutes in duration.

27th, 8 A. M. Had two paroxysms during the night, and one this morning, of about fifteen minutes.

28th, 8 A. M. Five attacks of pain since last note, two of which, the patient states, were the most severe he has ever endured.

29th, 8 A. M. The day appointed for the operation. Five paroxysms since yesterday, three of which were very severe. 11 A. M. Is prepared for the operation. Is calm and in good spirits, thinking only of the pain that he may suffer after the operation. Has had two paroxysms within the last three hours.

The operation was performed by Dr. F. F. Maury, assisted by Drs. W. H. Pancoast, J. H. Brinton, and S. W. Mitchell, in the amphitheatre of the Philadelphia Hospital in the presence of the clinical class.

The patient having been thoroughly anæsthetized with ether, the following steps may be noted: The shoulders were well elevated, and the head allowed to drop backward with the face strongly inclined to the sound side, the integument of the neck of the affected side being thereby rendered tense. This is a point of importance, causing the sterno-cleido-mastoid muscle to be prominently displayed. It is, moreover, especially desirable that the posterior border of this muscle be clearly defined as a landmark for the first incision. The next important step consisted in rendering prominent the course of the external jugular vein, which commences in the substance of the parotid gland, upon a level with the angle of the lower jaw, and runs perpendicularly down the neck in the direction of a line drawn from the angle of the jaw to the middle of the clavicle. The finger of an assistant pressed immediately above the last-named point rendered this vein distended. The incision was L shaped, with the long arm extending along the posterior border of the sterno-cleido-mastoid muscle, beginning three inches above the clavicle; the short arm following the course of the collar bone, as in the operation for the ligation of the subclavian artery. The length of both skin incisions is to be regulated by the size of the neck of the patient. The knife was carefully guided, so that it divided only the skin, under which conspicuously appeared the external jugular vein; this was pulled aside by the finger. The handle of the knife and the finger were then used to tear and separate the fascia in searching for the tendon of the omo-hyoid muscle, the next important guide. Immediately underneath the posterior belly of the omo-hyoid muscle, which it was not necessary to cut, being readily held aside by the finger or a blunt hook, were found the two cords of the brachial plexus. The outer or upper cord, composed of a fasciculus from the fourth, with the fifth, sixth, and seventh cervical nerves, was elevated by means of a curved aneurism needle armed with a silk ligature; the needle was withdrawn, the ligature left and loosely tied around the cord, was given to an assistant. The index-finger of the left hand was then placed in the wound, and the exact position of the subclavian artery ascertained; it was found, and held well out of the way and carefully protected. The trunk was next divided with blunt-pointed scissors, as near the finger of the left hand as possible, which was effected without difficulty.

Another division was made above the point of the ligature as far up as practicable, care being taken not to interfere with the scalenus anticus muscle, across the body of which passes the phrenic nerve, which was not seen. By this means four-fifths of an inch of nerve substance, carefully measured *immediately* after exsection, was removed, and the marked retraction of the cut ends gave a space two and a quarter inches from each extremity. The inner cord was then sought for and found directly underlying the outer; this cord, it will be borne in mind, is composed of the eighth cervical and first dorsal nerves. It was secured by needle and

ligature in the manner already mentioned, and the same amount of nerve exsected. Even greater care should be observed here in the protection of the subclavian artery, as it lies in immediate proximity with the inner cord. No vessels were divided, not even the transversalis colli, it being held carefully aside with the posterior belly of the omo-hyoid. The operation was therefore bloodless; no ligature was required.

The operation occupied one hour and a quarter, from the time of commencing etherization to the dressing of the wound. The incision was brought together, and covered with a pledget of oakum soaked with olive oil. The finger nails of both hands were stained with nitric acid, for the purpose of noting the growth of the nails. 5 P. M. Patient still more or less under the influence of the anæsthetic. The arm is completely paralyzed, and is without pain. 10½ P. M. Has had no pain since operation; is restless. One-fourth of a grain morphia given hypodermically.

30th, 7 A. M. Rested well through the night. Suffers no pain of any kind. 7 P. M. Has been comfortable through the day, and has eaten heartily. Ordered xl grs. bromide of potassium.

31st, 7 A. M. Slept well through the night until four o'clock, when he awoke and shortly after experienced a slight paroxysm of pain on the *top of shoulder*. It lasted five minutes, and was similar in character to the old pain. 4 P. M. Has been free from pain during the day; feels comfortable.

Nov. 1, 7 A. M. Just after getting asleep last night, he was awakened with pain about the top of the shoulder; it lasted fifteen minutes. Had slight pain an hour ago.

2d, 8 A. M. Did not sleep well; had a ringing sensation in his head. Complains of a tingling sensation in his arm. Slight paroxysm this morning. Wound of neck somewhat reddish.

3d, 7 A. M. Restless last evening; was ordered xxx grs. brom. pot., with ¼ gr. morphia. Was annoyed with pain three times during the night, but the attacks were light.

4th, 8 A. M. Rested well all night. While dressing this morning a paroxysm came on.

5th, 8 A. M. Had pain during the early part of the night, but slept comfortably during the night. Slight paroxysm while dressing wound. Stitches removed. Wound has united by first intention.

6th, 7 A. M. One very light paroxysm through the night.

7th, 7 A. M. Slept comfortably. One short attack of pain an hour ago.

8th, 7 A. M. Had one paroxysm during the night. It may here be observed that all the pain has been seated about the top of the shoulder.

11th. Still complains of the tingling sensation in the arm.

17th. Has been doing quite well, but has had one or two slight paroxysms during the twenty-four hours. The appetite is good, and he sleeps well. The finger nails have not grown at all upon the left hand (side of disease and operation), while on right hand they have grown an eighth of an inch. Strong tincture of aconite root was ordered to be applied as a continual dressing to the top of the shoulder.

24th. No relief has been obtained from the tincture.

29th. Is in good general health and spirits. Still continues to have one or two slight paroxysms through the day. The left forearm has been somewhat œdematous for several days past. It has been rubbed with an ammonia liniment, the unpleasant numbness and tingling in the part being greatly relieved by this means.

April 29, 1874. Since the foregoing notes were recorded, now five months, the patient has been under constant observation. During the month of January, a carbolic acid dressing, consisting of one part of the acid to three of glycerin, was applied to the painful shoulder. Vesication was produced, but without affording any relief.

May 12th. Within the past twenty-four hours the patient has experienced one paroxysm, which came upon him without apparent cause. He has also suffered four very slight attacks, all of them produced by external causes, as a draft of air, movement, nervous excitement, and the like.

13th. A repetition of yesterday's symptoms exactly.

The following table exhibits, in a condensed form, the state of the pulse and the temperature of the body before and after the operation. The temperatures were taken with great care, the portion of the bulb of the thermometer not in contact with the skin being surrounded and protected from the air by a piece of scooped out cork. The thermometer was allowed to remain in position from ten to fifteen minutes.

“*Pulse and Temperature,*” degrees Fahr. before Operation.

		Pulse.	Temperature.				
			Left axilla.	Right axilla.	Left palm.	Right palm.	Surface of left shoulder.
1873.							
Oct.	25th, 7 A. M.	68	98 $\frac{4}{5}$	98 $\frac{4}{5}$	96		
"	25th, 5 P. M.	80	97 $\frac{4}{5}$	97 $\frac{4}{5}$	94		
"	26th, 8 A. M.	70	98	98	95		
"	27th, 8 A. M.	76	98 $\frac{3}{5}$	98 $\frac{3}{5}$	95		
"	28th, 8 A. M.	80	97 $\frac{3}{5}$	97 $\frac{3}{5}$	94		
"	29th, 8 A. M.	80	97 $\frac{3}{5}$	97 $\frac{3}{5}$	94	94 $\frac{2}{5}$	
After operation.							
Oct.	29th, 5 P. M.	80	100 $\frac{2}{5}$	98	99	91	
"	29th, 10 P. M.	88	101 $\frac{2}{5}$	100	100	97	
"	30th, 7 A. M.	92	99 $\frac{3}{5}$	98	98 $\frac{4}{5}$	98	
"	30th, 7 P. M.	80	100 $\frac{1}{5}$	99 $\frac{3}{5}$	99 $\frac{2}{5}$	98 $\frac{3}{5}$	
"	31st, 6 A. M.	76	98 $\frac{3}{5}$	97 $\frac{4}{5}$	97 $\frac{2}{5}$	96 $\frac{3}{5}$	
"	31st, 4 P. M.	80	99 $\frac{4}{5}$	98 $\frac{3}{5}$	99 $\frac{2}{5}$	98	
Nov.	1st, 7 A. M.	76	98	97 $\frac{1}{5}$	97	96	
"	1st, 5 P. M.	80	99 $\frac{4}{5}$	98 $\frac{3}{5}$	98 $\frac{1}{5}$	96 $\frac{4}{5}$	
"	2d, 8 P. M.	80	99	98 $\frac{2}{5}$	97 $\frac{3}{5}$	97	
"	3d, 7 A. M.	84	98 $\frac{1}{5}$	97 $\frac{2}{5}$	97	96 $\frac{4}{5}$	
"	5th, 7 A. M.	76	97 $\frac{4}{5}$	97 $\frac{1}{5}$	96 $\frac{2}{5}$	96	
"	6th, 7 A. M.	72	98	97 $\frac{2}{5}$	97 $\frac{2}{5}$	96 $\frac{3}{5}$	
"	9th, 7 A. M.	80	97 $\frac{3}{5}$	97 $\frac{1}{5}$	97	96 $\frac{4}{5}$	
1874.							
April	29th,	96	99 $\frac{1}{5}$	99 $\frac{4}{5}$	94 $\frac{1}{5}$	99 $\frac{1}{5}$	
May	2d,	...	...	95 $\frac{3}{5}$	92 $\frac{1}{5}$	
"	3d,	...	...	97 $\frac{1}{5}$	87 $\frac{3}{5}$	

The thermal observations here given settle conclusively the mooted points as to the effect in man of nerve sections on temperature. They coincide

strikingly with the results obtained by Dr. Weir Mitchell in a case of section of median nerve (see present No. of this Journal), and again fulfil the prediction made on this subject by the above-named author.¹

Before the operation and section in our own case, the left palmar temperature ranged from 94° to 96° F. It rose within three or four hours after the section to 99° F.; at 10 P. M. it was 100° , and up to Nov. 9th was never, save once, as low as $96\frac{2}{5}^{\circ}$, being usually a degree or more above that of the right palm. When again in April the temperature was taken it was, at 8 P. M., after a period of some pain and re-excitement; left palm $94\frac{1}{4}^{\circ}$; right palm $99\frac{4}{5}^{\circ}$. Upon May 2d it was even lower; left palm $92\frac{1}{4}^{\circ}$; right palm $95\frac{3}{4}^{\circ}$; and the following day the left palm was only $87\frac{3}{4}^{\circ}$; the right do., being $97\frac{1}{4}^{\circ}$.

The result of the operation may be summed up as follows: Our patient suffers but one painful paroxysm, and some four slight attacks of pain, in the course of the twenty-four hours. This statement may be received as an average of his sufferings since the operation, and the symptoms appear to be neither abating nor increasing at the present time. The general health is excellent. As a rule he sleeps quite comfortably through the night, now and then awaking from an attack of pain.

The muscles of the shoulder are conspicuously wasted, that of the deltoid being most notable, so that the head of the humerus has dropped at least an inch out of the glenoid cavity. The great and general œdema of the whole limb masks the lower atrophies in the forearm; but on removing the œdema by a bandage the muscle-losses become plain, as well as the bone-like hardness of their contracting tissues.

For two days after the operation an induced current of full power moved all the forearm muscles, but this capacity to respond declined by degrees, and at the fourth day a powerful galvanic current, interrupted and reversed, was needed to show them. The downward current acted best. April 29, no severity of any form of current moved the muscles, nor did they stir when galvanized through needles passed into their substance (75 cells), interrupted and reversed current.

The skin of the arm and forearm is very dry and desquamates slightly. The fingers of the hand are all contracted, more or less, the third, fourth, and fifth most, partly owing to an old injury, but chiefly following the operation. The skin of the hand, especially about the knuckles, is reddish and smooth, accompanied with desquamation of the epidermis. There is marked incurvation of the nails on both sides (turtle-back nails), but especially on the left side, where they are very greatly curved. The difference in the growth of the nails is still very evident from the old staining; it is a difference of at least one-half.

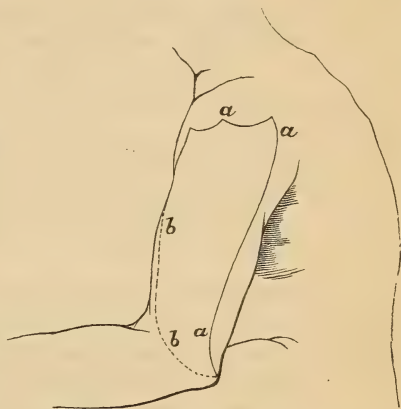
As regards the appearance of the skin of the shoulder, and the nodules

¹ Injuries to Nerves, p. 177.

upon it, there is little change to note since the operation. It still retains its characteristics as described in connection with the history of the case, without any decided appreciable alteration.

A careful study was made by Dr. Perry, the hospital resident, of the region of lost sensation; and in April, Dr. Weir Mitchell and one of us (Dr. Duhring) repeated this examination, with no notably different results.

Touch and pain, as tested by needle points, were absent in a region of skin which included all of the forearm and hand and face of the arm, bounded by an irregular line on the two sides, and above, on the front of the shoulder, by a still more irregular limit. The whole back and inner surface of the arm to the elbow was sensitive to touch and to the needle; but more so above than below. Even in the anterior arm space, where the needle entered painlessly, there were here and there regions in which distinct and well-localized pain was felt when Dr. Mitchell inserted needle points into the



The line *a, a*, on the outer-surface of the arm, marks the boundary above and outside of which sensation is preserved. The dotted line *b, b*, marks the same for the inner surface of the arm.

dermis, and transmitted through them the current of 50 to 75 Collat. cells. The wire brush on the dry skin yielded us no signs of feeling. The diagram gives an idea of the limiting lines which bound the areas of lost or lessened feeling.

No new tubercles have appeared on the arm, though several small new ones are observed upon the back, about the scapular region; they are the size of split peas, and as yet are only painful upon pressure.

When we consider then the state of our patient before the operation, and his present condition, there is every reason to feel gratified with the result; for although the suffering has not been completely removed, the relief afforded has been so great and so decided as to admit of no question. The patient himself bears frequent and willing testimony upon this point, stating that he is well satisfied with the success of the operation, and thankful for the ease obtained. He is now able to live in at least comparative comfort, whereas before he was in continuous pain, and this of so grievous a character as to be almost intolerable. The complete paralysis of the arm is of little moment to the patient, and is scarcely worthy of consideration in comparison to his previous sufferings; for the limb had not only to be guarded, but preserved as free from all movement as possible, the least exertion or motion being followed by paroxysmal

pain. We remark here, that absolute relief from pain was not expected from the division of the nerves operated upon; for, as is known, the third cervical nerve gives off branches which supply the skin of the top of the shoulder, which would still continue to exert its influence. The result has realized the views entertained upon this point previous to the operation. It is, without doubt, from the cutaneous branches of the third cervical nerve that the pain which the patient now experiences proceeds.

Concerning the operation, two practical points may be briefly referred to. In the first place, the facility with which the cords of the brachial plexus were reached; the procedure being by no means so difficult a task as was imagined. Secondly, it is of particular interest to note the total absence of shock following the operation, a condition which it was expected might readily follow such a serious systemic disturbance.

Through the kindness of Dr. R. M. Bertolet, we are enabled to present the appended report of the microscopic examination of the exsected nerve:—

"The excised portions of the nerves were, after the operation, at once placed in a 2 per cent. solution of chromic acid and hardened for section. Transverse cuts, stained in carmine and mounted in damar varnish, revealed the existence of what, at first sight, appeared to be an abnormally thick, hypertrophied enveloping sheath (neurilemma); but upon closer study, and on comparing with sections of the normal brachial plexus, it was evident that this apparent excessive development of the connective tissue sheath was no more than proportional to the increased size of the nerve trunk itself in this region.

"The connective tissue septa arising from the neurilemma, and subdividing the nerve trunks into secondary bundles, were scarcely, if any, more strongly developed than ordinarily; no marked proliferation of the connective tissue corpuscles existed. In the secondary fasciculi of the nerve, however, at many places were seen accumulations of young migratory cells ('granulation' of Virchow). The aggregation of these elements between the primitive nerve fibre was so great, at not a few points, as to press them widely asunder and lead to a corresponding atrophy of the individual fibres. The axis-cylinders were seen distinctly in every instance; the atrophy having taken place mostly at the expense of the surrounding medullary substance. The nerves that underwent these atrophic changes presented a very bright, highly refractive, glassy appearance under the microscope, strongly reminding one of amyloid degeneration, yet the iodine test failed to give any reaction; this if present, however, would not have responded on account of the preservative fluid employed. These bright spots occurred in circumscribed areas of the nerve bundles, while in the remaining portions the nerve fibres were unaffected; there having been just the faintest suspicion of commencing proliferation of the interstitial substance.

"In this specimen we do not have the same material growth of connective tissue, nor the attendant fatty metamorphosis, usually seen in marked cases¹ of *neuritis interstitialis*; yet the alterations found are sufficient to indicate that

¹ Virchow's Archiv, Bd. 53, p. 441.

this nerve has already fully entered the earlier stages of these inflammatory changes."

In conclusion, we desire to express our thanks to Dr. Mitchell for valuable suggestions offered, as well as for the interest manifested in the study of the case. For the careful attention to the patient, and for notes after the operation, our thanks are tendered to Dr. H. M. Perry, one of the House-Surgeons to the Hospital.

ART. III.—*Retinal Hemorrhage and its Connection with Cerebral, Cardiac, and Renal Lesions.* By CHARLES S. BULL, A.M., M.D., Assistant Surgeon to the New York Eye and Ear Infirmary; Microscopist to the Manhattan Eye and Ear Hospital.

RETINAL hemorrhage, or apoplexy of the retina, is an affection doubly interesting to the ophthalmologist and pathologist, not only intrinsically, but also from its connection with other affections, local as well as general. It is by no means a rare lesion, and offers an interesting field for observation and study, in respect of its causation and pathology.

Its causation is of a twofold nature; that is, the hemorrhage may have an intrinsic and an extrinsic origin. It may arise from disease within the eye, as neuro-retinitis, retinitis, or glaucoma, and is then said to be intrinsic in its origin; or it may originate in cardiac disease, chronic renal disease, or general disease of the vascular walls throughout the body. We occasionally meet with retinal hemorrhage in that obscure class of cases which we group under the head of the hemorrhagic diathesis, where there does not seem to be any particular disease of the vessels, and yet the patients suffer loss of blood from repeated hemorrhages from the mucous membranes and occasionally from the cutaneous surface. A sudden hemorrhage into the retina or vitreous humor, from the rupture of a retinal or choroidal vessel, may arise from some disease of the heart, or from an atheromatous condition of the coats of the vessels, or from chronic disease of the kidneys, and also, though rarely, from suppressed menstruation. When the hemorrhagic diathesis seems to be the predisposing cause, it almost always occurs in young persons, and there are generally multiple extravasations in the retina and vitreous humor. By the aid of the ophthalmoscope we can distinguish three varieties of hemorrhage, and some authorities say four. The first variety consists of small round spots or points, circumscribed or scattered over the whole fundus, though generally in the neighbourhood of a vessel. Secondly, we meet with longitudinal streaks or bands, and these are in the nerve-fibre layer. Thirdly, there occur larger, irregular masses, situated always near the large veins. The

fourth variety is a complete suffusion of the retina, a continuous extravasation of blood. These hemorrhages may be confined entirely to the retina, and this is usually the case; but it is by no means rare to meet with patients who complain of having lost their sight suddenly, and on examining the eye with the ophthalmoscope we get no reflex, and find the whole vitreous humor infiltrated with blood. It does not necessarily follow that this is the worst form of the disease, for the blood is generally absorbed, and some amount of vision at least restored. But in such extensive extravasations the blood generally comes from a ruptured choroidal vessel, showing that the trouble is not confined to the retina, but involves also the vascular tissue of the eye. Where the source of the hemorrhage is a retinal vessel, the extravasation always seems to show a greater tendency to extend outwards to the choroid than inwards towards the vitreous humor.

Apoplexy of the retina, having once occurred, shows a great tendency to recur, and where the recurrences are frequent, they may increase markedly the intraocular tension and give rise to hemorrhagic glaucoma. As an independent lesion, without any accompanying lesion of the tissue of the retina, apoplexy of the retina rarely occurs except in advanced life, most frequently after the fiftieth year, though it may accompany any form of retinitis at any age. Occasionally, though very rarely, it occurs coincidentally with *purpura hemorrhagica*.

M. Rue, in the "*Union Médicale*" for 1870, cites a case of retinal hemorrhage accompanying an attack of *purpura hemorrhagica* in a labourer, fifty years of age, who was an excessive drinker. Besides numerous spots of *purpura* upon the skin and mucous membrane of the mouth, the man had hematemesis, bloody stools, and numerous large hemorrhages into the retina, with marked disturbance of vision. In the right eye there was a hemorrhage into the macula lutea. Eight days later the spots of extravasation were darker, and in some there appeared small white spots. There was no albuminuria. The autopsy did not show any special changes in the organs, except the hemorrhages, and there was no change in the bloodvessels, as shown by the microscope. Some of the hemorrhages were in the choroid. There were some few fat granules in the tissue of the retina, but none in the walls of the vessels.

When these hemorrhages occur without any inflammatory action in the retina, they must be regarded as a sign of an anomalous state of the circulation, and an unfavourable prognosis is to be given.

Retinal apoplexy is ordinarily accompanied by a slight serous transudation into the tissue of the retina, which gives the latter an œdematous appearance. The prognosis is always more or less unfavourable, not so much on account of possible injury to the vision, as on account of its being a symptom of profound trouble elsewhere.

It often occurs simultaneously with lesion of the heart, and advanced general atheromatous degeneration of the walls of the bloodvessels, which

two morbid conditions are frequently the source of grave cerebral affections. The prognosis becomes still more unfavourable if it is a second or third attack.

When the retina itself is inflamed, then the walls of the vessels are involved. The extravasations in a retinitis are usually slight, but often very numerous. They are generally situated in the inner layers of the retina, but under the pressure of the blood they not unfrequently press into the meshes of its connective tissue framework. In this situation they appear columnar in shape, but near the papilla they are elongated. The frequent occurrence of extravasations in inflammation of the retina finds another cause in the swelling of the optic disk, from the nerve being involved, and the consequent venous congestion. Stellwag tells us that retinal hemorrhages occur not uncommonly in old people, particularly in those having a tendency to capillary hemorrhage of the brain. It is generally conceded that hypertrophy of the left ventricle of the heart increases the tendency to these hemorrhages.

And now, what are the subjective symptoms of a retinal apoplexy? Sometimes, though not very often, the patient may have some premonitory warnings of a faulty circulation, particularly if he is advanced in years. There may be attacks of vertigo and amblyopia, transient in duration, but recurring. But usually the hemorrhage occurs suddenly, and this is one of the most characteristic symptoms. The patient may wake in the morning and find that he is blind in one or both eyes, though usually the disease is confined to one eye, at least in the beginning. It may occur while he is pursuing his ordinary avocations, appearing as a dark red or black spot or ball before the eye, which rapidly extends and obscures the entire field of vision. Of course the impairment of sight produced by the hemorrhage depends on the extent of the effusion and its locality. There may be a single large clot, or a number of small ones. If the clot is a large one, the hyaloid membrane is usually ruptured, and the vitreous humor becomes filled with blood, and this is generally the case when the extravasation comes from a choroidal vessel.

Whether constitutional syphilis exerts any predisposition to retinal hemorrhage is by no means certain. Though inflammation of the retina is a not uncommon symptom in general syphilis, hemorrhages in this form of retinitis are not often seen, and though some authorities assert that syphilitic patients are very predisposed to what is usually called "retinitis apoplectica," their assertions are not sufficiently fortified by actual cases to be of very great value. The form of retinitis observed in constitutional syphilis is not usually of the exudative variety. The retina is swollen and œdematous and soon loses its transparency, but there is rarely anything more than a serous exudation. In a published account of clinical observations made at Wiesbaden for the years 1863 to 1866, Dr. Mandelstamm reports that among nine cases of syphilitic retinitis, there

were four of them accompanied by hemorrhagic extravasations, thus proving the assertion of some observers to be wrong, that apoplexy of the retina never occurs in syphilitic retinitis.

Retinal hemorrhages occur by far more frequently in men than in women, and also much oftener in patients over fifty years of age than under it. In the same report of Dr. Mandelstamm, just quoted, out of 26 cases of retinal apoplexy, 22 occurred in patients from fifty to eighty years of age, and 24 of the 26 cases were in men. Dr. Mandelstamm calls particular attention to the fact that the hemorrhages most frequently occurred in persons between seventy and eighty years of age, and thinks it by no means hypothetical to conclude that they are caused by atheromatous changes in the walls of the bloodvessels. In a report of the same institution at Wiesbaden for the years 1861 and 1862, Dr. Pagenstecher reports 19 cases of retinal apoplexy in two years, and calls attention to the fact that in many of these cases the amount of functional disturbance was comparatively slight, and by no means commensurate with the pathological changes as seen with the ophthalmoscope.

One of the cases was a robust man, thirty-three years of age, who had extensive hemorrhagic extravasations all over the surface of the retina, except at the macula lutea, and yet he read Jaeger No. 4 type, and had a normal field of vision. Five months later the hemorrhages were all absorbed and the patient read Jaeger No. 1 type. In this case there was no organic affection diagnosticated.

The connection of retinal hemorrhage with lesions of the brain, heart, and kidneys is one of very great interest, and at the same time is still somewhat obscure. Perhaps the greatest doubt has been thrown upon the statements of some writers, that the hemorrhages into the retina occurring in elderly people are to be regarded as a premonitory or precursory sign of cerebral apoplexy. Of course, the only way to confirm the statement is to tabulate a sufficient number of cases in which extravasations into the retina have been followed at a varying interval by cerebral hemorrhage. This has not been done, and from the nature of things would be difficult of accomplishment. As a rule, we are unable to keep our patients under observation for any great length of time; yet, with some care I am convinced we might, in time, collect some valuable statistics on this point. I have seen three cases in which retinal apoplexy was followed by cerebral apoplexy, and I have now under observation a fourth case, which I expect will follow the same course. The history of these cases will be given subsequently in detail. Dr. Allbutt, in his valuable work on the ophthalmoscope, says that in cases of large cerebral hemorrhage, where there has been retinal disease and chronic disease of the kidneys, there were usually seen small hemorrhagic extravasations about the optic disks, but considers that these may occur in patients without the danger of an attack of cerebral hemorrhage, and even when the patients do not complain of their vision.

Hemorrhage into the retina has been recorded in a number of cases of encephalic apoplexy, but Dr. Allbutt is not disposed to think that any pressure upon the recurrent vessels could cause a rupture of the retinal vessels unless they were diseased. But we know as an established fact that in all cases of cerebral apoplexy occurring in old people, there is always atheromatous degeneration of the walls of the vessels generally throughout the body, and of course the retinal vessels do not escape.

Dr. Berthold, in the *Klinische Monatsblätter für Augenheilkunde* for April, 1870, relates a case of a woman, between thirty-five and forty years of age, who came to him with the complaint of sudden loss of vision in the right eye, and on examination with the ophthalmoscope he found a hemorrhage into the macula lutea. As he was on the point of dropping in some atropia to dilate the pupil, so that he might examine the whole fundus more carefully, she suddenly complained of feeling unwell, fell back, and died in three-quarters of an hour with all the signs of cerebral apoplexy. Unfortunately there was no autopsy. Dr. Heymann, in the year 1864, in the same journal, relates a case of retinal apoplexy occurring two months after the vision commenced to fail; the hemorrhages were situated near the optic disk, were from the veins, and rapidly increased in size and number. One month after their first appearance came the first attack of unconsciousness and paralysis. Before this the eye had given signs of neuritis and progressive atrophy of the optic nerve fibres. The hemorrhages occurred in both eyes to about the same extent.

There were probably in this last case cerebral lesions at the base of the brain near the left ventricle. The first ophthalmoscopic sign visible was the engorgement of the retinal veins, due to some hindrance to the flow of venous blood. Subsequently the pressure became greater, as was proved by a double sign, narrowing of the arterial calibre and rupture of the veins. Then came the sclerosis of the connective tissue of the nerve and retina, and finally the signs of apoplexy.

Dr. Reynolds considers that clots in the retina are to be regarded as warning symptoms of a cerebral lesion, and after the age of forty, they point at least frequently to the danger of the patient dying of cerebral hemorrhage. Dr. Tanner also considers them as warnings of cerebral lesions, classing them with the sudden transient attacks of blindness and diplopia which are met with. Dr. Hammond says, in speaking of cerebral hemorrhage, that defects of sight may occur, usually characterized by the presence of dark spots in the axis of vision. These are due to minute extravasations of blood into the retina, and are always of most serious importance. He says he has known retinal hemorrhages to precede by more than a year the occurrence of a more severe lesion.

Dr. Colsman, of Barmen, has reported a number of cases of retinal hemorrhage in the *Berliner Klinische Wochenschrift* for February, 1870, some of which were followed by cerebral apoplexy. He draws particular attention to the fact that the retina is peculiarly liable to disturbances in its circulation, owing to its anatomical connections and anastomoses with

the vessels of the cranial cavity and jugular veins. This may either result in anæmia from hindrance to the arterial current, or in congestive hyperæmia due to pressure on the venous circulation from some cause within or without the cranium. Instances of the latter condition are by no means rare, such as swelling of the tissue of the optic nerve and retina from the pressure caused by tumours within the cranium or orbit, giving us the "*stauungs-papille*" of Von Graefe, in which hemorrhagic extravasations into the retina are very common. Dr. Colman considers that in a general fatty or atheromatous degeneration of the vessels, retinal hemorrhages are to be regarded as preceding or accompanying cerebral apoplexy. In those cases where there is no perceptible disease of the arteries, he thinks that an increased blood pressure in the cranial veins from whatever cause, is readily propagated to the retinal veins owing to the rich anastomosis of the ophthalmic vein with the cavernous sinus. We no doubt sometimes meet with cases in which there is apparently no cause for the retinal hemorrhages, and these are just the ones which require most minute and careful scrutiny. A rigid examination will usually establish some etiological connection between the state of the retina and some other organ or tissue in the body.

One of Dr. Colman's cases was a very corpulent woman, without any organic lesion, who had suffered from repeated attacks of retinal apoplexy. His ninth reported case was one of repeated hemorrhages into the retina in a woman, sixty-two years of age. There were a number of small, bandlike hemorrhages all over the retina of both eyes, some recent, others which had undergone retrogressive metamorphosis. There was no other disease of the eyes, nor of any organ in the body which might cause these extravasations. The sight improved somewhat as the hemorrhages became absorbed, but the patient soon after died of cerebral apoplexy. His eleventh reported case occurred in a perfectly healthy man, forty-two years of age, who complained of periodically recurring and transient redness of the conjunctiva and dimness of vision of one eye. There was œdema of the retina and papilla of this eye and some delicate hemorrhages. The patient complained of severe headache, particularly after any bodily exertion. About three months later he died suddenly from cerebral apoplexy. All these symptoms pointed to an abnormal state of the cerebral circulation.

The following four cases were under the writer's own observation for a time, and as the various symptoms point to an intimate connection between lesions of the retina and lesions of the brain, the histories will be given somewhat in detail :—

CASE I.—A. P., aged sixty-three, English, married, a book-keeper, applied to me in 1871 for an affection of the right eye, of some fourteen months' standing. He complained of a suddenly occurring dimness of vision, coming on at irregular periods, lasting a varying length of time, though never more than a few hours, and always being more intense when it first appeared, and gradually growing better. He said he had always led an exceptionally temperate life, and was apparently in excellent health. On examining the eye there was nothing abnormal externally, but with the ophthalmoscope there were seen a number of small, punctate hemorrhages

all over the retina, and some two or three upon the optic disk itself. There was no œdema of the retina, and no large extravasation anywhere. The retinal veins were perhaps a trifle engorged. The other eye was perfectly normal. His heart was examined and found healthy, as were also the liver and kidneys, the urine having been repeatedly examined and nothing abnormal found. A closer investigation showed disease of the radial and temporal arteries. The patient said that he frequently felt a fulness in the head after a meal or after stooping, but that the feeling soon passed off. Being sure of the connection between the repeated retinal lesions and the cerebral circulation, I cautioned the patient to lead a very quiet life, avoid all undue muscular and mental exertion, and report himself from time to time. He was seen three or four times and then disappeared, and on going to inquire about him, I was informed that he had died from cerebral apoplexy, following a recurrence of the dimness of vision. The death took place about eighteen months after the first appearance of the retinal lesion.

CASE II.—R. H., aged fifty-four, Irish, married, a gardener, applied to me for a sudden loss of sight in the left eye, which had come on two days before, while working at his business. The patient was short and stout, of full habit, and had in former years been a hard drinker. He had suffered from vague rheumatic pains for years, but had never had any distinct attack of rheumatism. He said he had always considered himself a healthy man until this failure of his sight. On testing his vision, I found he could count fingers at about ten feet, and could just make out Snellen CC at three feet; the vision in the other eye was normal. With the ophthalmoscope there were seen three large hemorrhages in the retina, two in the course of the ascending vein, and one along the main branch of the descending vein. There was no œdema and no pulsation, and the other eye was normal. His heart was examined and found healthy, though it was beating much more rapidly than was normal, but this, he said, had been the case for years. The urine was repeatedly examined, but nothing could be found that pointed to renal disease. His arteries were slightly atheromatous, but not markedly so. The patient was seen from time to time, and occasionally some small fresh hemorrhages made their appearance in the retina. He died suddenly one night after running rapidly some distance, with all the signs of cerebral hemorrhage.

CASE III.—W. H. B., American, aged fifty-two, single, a lumberman, complained of a sudden attack of blindness in both eyes, which had come on about a month before. Since then the vision had improved somewhat, though it was still very dim. The patient had been a man of violent passions, a hard drinker, and, while in the army, had contracted a severe type of malarial fever in some of the swamps of the Southwest, from which he had never entirely recovered. The liver was considerably enlarged, occasionally painful, and he suffered habitually from dyspeptic symptoms. There was a loud, blowing murmur over the base of the heart, synchronous with the first sound. I could detect no disease of the kidneys, though there was occasionally some pain in the lumbar region. On examining his

20

eyes the vision was found reduced to $\frac{20}{60}$, and the ophthalmoscope showed numerous hemorrhages in the retina of variable size and shape, most of them undergoing retrogressive metamorphosis. The extravasations were so numerous as to give a general brownish colour to the whole fundus. The patient was told plainly the condition of affairs and the danger in which

he stood, and was advised to return to his home in Wisconsin and lead a quiet life. This he promised to do, but I afterwards heard that he had become paralyzed, and died unconscious, probably from cerebral hemorrhage.

CASE IV.—Mrs. T. C. S., aged sixty-four, applied to me in February of this year for a failure of vision which had come on suddenly in both eyes, and which had gradually grown worse. On examination, vision with

the right eye was $\frac{10}{\text{CC}}$, and with the left $\frac{20}{\text{C}}$. With the ophthalmoscope

there were seen numerous large hemorrhages in the right retina, and incipient cataract. The extravasations were all in the course of the large retinal veins. In the left eye there were not nearly so many clots, and they were smaller than in the right eye. There was also an incipient cataract in this eye. The patient is of very full habit, short and stout, with chronic valvular disease of the heart, and a marked arcus senilis. She also suffers from chronic cystic catarrh and a femoral hernia of the right side. The urine has been examined carefully, and neither albumen nor casts have been found. The patient is still under observation, but I expect to hear of her death by cerebral hemorrhage, which may occur at any time.

It is a well-known fact that hemorrhage into the retina is a common accident in the advanced stages of chronic Bright's disease. Dr. George Johnson, of King's College Hospital, London, has advanced some interesting points explanatory of their causation, in the *Medical Times and Gazette* for July 2, 1870. In this disease of the kidneys, he says, the muscular walls of the minute arteries in most of the tissues, are much hypertrophied, owing to long-continued overaction. Excessive contraction of the minute systemic arteries impedes the onward movement of the blood, and calls for increased efforts on the part of the heart to carry on the circulation. Hence hypertrophy of the left ventricle. An obvious result of the struggle between the increased action of the heart and the increased arterial resistance is an increased strain and pressure on the arterial walls, and a consequent increased risk of hemorrhage from rupture of one or more minute arteries, such as we frequently meet with in a punctate cerebral hemorrhage. Dr. Johnson has observed in cases of Bright's disease with hypertrophy of the left ventricle, that, while as a rule the minute arteries in all the tissues have their muscular walls hypertrophied, the hypertrophy of the arteries of different tissues in the same subject is sometimes unequal. May not the hemorrhages into the retina and brain, that we meet with in these cases, be due to the fact that the increased propelling force of the hypertrophied left ventricle was not counterbalanced by an equivalent hypertrophy, and consequent resisting power in the minute cerebral and retinal vessels? Of course we must depend upon the microscope for solving the question whether the retinal vessels are hypertrophied or not, in cases of chronic Bright's disease, and, unfortunately, we are not very often able to get possession of the eyes of patients who have died from chronic renal disease. I was fortunate

enough, during the past summer, to follow up a case of retinitis albuminurica with hemorrhages, which I had seen in consultation. I was present at the autopsy, and got possession of one kidney, the heart, and one eye. A careful microscopic examination showed a very marked hypertrophy of the renal capillaries and small vessels of the heart, but the retinal and choroidal vessels were not much hypertrophied, though their walls were somewhat thicker than normal. This one case seems to go to support Dr. Johnson's views, but we need more cases. The situation of the hemorrhages in the retina which accompany retinitis albuminurica is somewhat different from the situation of retinal clots occurring in other forms of retinitis, though not always so; at least this is the conclusion I have drawn from my observations. We must recollect that in the class of cases now under consideration there is a pathological process going on in the eye, which if not always a strictly inflammatory one, yet always induces permanent destructive changes in the retina. We may say that there is always an inflammation of the retina present, the morbid process at first going on in the inner layers of the retina, anterior to and also involving the retinal vessels. There is always a degeneration of these vessels, and very soon the engorged and tortuous vessels rupture and extravasations of blood occur, partly in the form of fine, radiating streaks between the bundles of nerve fibres, partly in the form of larger oval or circular spots rendering it very difficult to recognize the smaller vessels. I have observed almost invariably that these hemorrhages occur around the posterior pole of the eye, or rather round the entrance of the optic nerve, and between the disk and the macula. They seem, as a rule, to have the form of the spokes of a wheel, radiating from the optic papilla as a centre. They occur most frequently in the advanced stages of the morbid process of the retina, after the outline of the papilla has become obscured, and the disk has become surrounded by a wall of brawny infiltration. On this wall small hemorrhages occur very frequently. There does not appear to be any particular period in the course of the renal disease at which these hemorrhages occur, though we are far more likely to meet with them at the period when the excretion of urine is more and more interfered with, consequent upon the atrophy of the renal tissue. Here the general circulation becomes more and more impeded, and the tension of the vascular system, augmented by the increased action of the hypertrophied ventricle, finally reaches a point where rupture ensues and extravasations occur. The blood does not always come from the larger vessels, though it sometimes does. *Hulke* says that he does not recollect an instance among the cases which he submitted to microscopic examination, in which the hemorrhage came from the larger vessels; it was always from the capillaries. The hemorrhages are usually in the inner layers of the retina, next the vitreous humor, though sometimes they infiltrate the whole thickness of the retina, and are even met with between the choroid and retina. In the case mentioned

above, in which I was fortunate enough to obtain the eye for examination, the extravasations in the retina were all in the nerve fibre and internal granule layers, but there were two or three clots in the swollen tissue of the optic disk, and quite a large one in the tissue of the nerve itself, just in the region of the lamina cribrosa. In this case the extravasations came from both large vessels and capillaries. Another point which I have observed in cases of retinitis albuminurica, is that retinal hemorrhages scarcely ever occur unless there is at the same time organic disease of the heart. They do occur sometimes where there is no cardiac complication, but this is not often the case. During the past three years I have had the opportunity of observing eighteen cases of retinitis associated with renal disease, and from these cases I have drawn the above conclusion.

The first case was a man, 30 years of age, who had all the symptoms of chronic Bright's disease, with affected vision in both eyes. The ophthalmoscope showed infiltration of the retina at the macula lutea, round the optic nerve, and between the nerve and the macula, and at the periphery near the ora serrata, there were patches of choroidal atrophy. Between the nerve and the macula in each eye were a number of longitudinal hemorrhages, always more superficial to the peculiar yellowish-white, glistening exudations. This man had hypertrophy of the left ventricle of the heart, with chronic valvular disease. He had moderate œdema of the face and extremities, frequent attacks of uræmic amblyopia, and marked dyspnœa. The urine contained albumen and fatty casts.

Case second was a man, 32 years of age, who had, when first seen, the peculiar stellate exudation round the macula and a brawny infiltration of the optic papilla, with a few small thread-like hemorrhages round the nerve entrance and upon the disk. Three weeks later he complained of being entirely blind in the left eye, and on examining him with the ophthalmoscope, the whole vitreous humor was found opaque, probably from a large hemorrhage, which completely concealed the fundus. This man had a tremendous rough, blowing sound at the apex of the heart, synchronous with the first sound, with marked hypertrophy. His urine contained albumen and granular casts.

Case third was a woman, 60 years of age, with œdema of the legs and feet, marked ascites, pale waxy complexion, and some dyspnœa. There was a mitral regurgitant murmur, hypertrophy of the heart, and constant palpitation. The retinae of both eyes were strewn with hemorrhages, but there was very little exudation into the tissue of the retina. The urine contained albumen, but no casts.

Case fourth was a man, 23 years of age, and was an exceptional one, in that, though the retinal hemorrhages were very abundant, and the renal symptoms most marked, he had no cardiac lesion.

Case fifth was a man, 55 years of age, in whom the hemorrhages were confined to the right eye, though both retinae were involved in the fatty degeneration. He had both valvular disease and hypertrophy of the heart. The urine contained albumen and casts.

Case sixth was a man, 43 years of age, with hemorrhage in both eyes, fatty degeneration of the retinae, and hypertrophy of the heart, but no valvular lesion. He had uræmic convulsions, and his urine was loaded with albumen and casts.

Case seventh was a boy, aged 15 years, with fatty infiltration of the retina in each eye, but no hemorrhages. He had no heart disease, and no very pronounced signs of chronic renal disorder except frequent micturition, though there was a history of convulsions and his urine contained albumen.

Case eighth was a woman, 18 years of age, with very marked retinitis albuminurica in both eyes, but no hemorrhages. She had no cardiac disease, but a great deal of general anasarca. Urine albuminous.

Case ninth was also a woman, 19 years of age, with retinitis albuminurica in both eyes, though most developed in the right eye, but there were a large number of hemorrhages on and around the optic papilla. She had had acute articular rheumatism three years before, and had both valvular disease and hypertrophy of the heart. The urine contained neither albumen nor casts.

Case tenth was a man, 23 years of age, with retinitis albuminurica but no hemorrhages. There was no cardiac disease, but the liver was very much enlarged, and there was considerable abdominal dropsy. The urine contained albumen, but no casts.

Case eleventh was a woman, 35 years of age, with retinitis nephritica, and enormous hemorrhages in both retinae. There was chronic valvular disease of the heart and some hypertrophy. The urine was albuminous, but contained no casts.

Case twelfth was also a woman, 47 years of age, with hemorrhages in each eye, punctate in character, and a general œdematous appearance of the retinae. She had both hypertrophy and valvular disease of the heart. The urine contained albumen and casts.

Case thirteenth was a woman, 25 years of age, with typical retinitis albuminurica, but no hemorrhages, and this patient had no cardiac complication.

Case fourteenth was a woman, 50 years of age, with incipient cataract and posterior staphyloma in the left eye, and retinitis nephritica with many hemorrhages in the right eye. She had chronic valvular disease and hypertrophy of the heart.

Case fifteenth was a woman, 43 years of age, with both eyes affected by the peculiar exudation accompanying chronic Bright's disease, and numerous small hemorrhages in both eyes. Chronic valvular disease and very marked hypertrophy of the heart. Urine loaded with albumen and casts.

Case sixteenth was a woman, 20 years of age, who had for several months suffered from general anasarca and occasional convulsions, epileptiform in character. There was no history of rheumatism, and on examining her chest no cardiac disease was detected. Her urine was nearly half solid with albumen, and contained casts of all kinds. With the ophthalmoscope the retina of each eye was seen to be the seat of the peculiar changes accompanying Bright's disease, but there were no hemorrhages. This case I had an opportunity of observing from time to time for more than a year, and at no time was there any extravasation of blood seen.

Case seventeenth was a woman, 25 years of age, in whom the renal trouble was consequent upon a gravid uterus. It was her first pregnancy, and during the sixth month she had some swelling of the feet and ankles, and shortly afterwards a series of convulsions, which lasted till evening, when she aborted. Immediately after this her eyesight began to fail, and she complained of dyspnœa and palpitation. On examining her eyes, I saw a neuro-retinitis in both, with enormous exudation into the disk and

retina and upon the disk two considerable hemorrhages in the left eye, and a number of smaller ones in the right eye. An examination of the chest revealed hypertrophy and valvular disease of the heart. A few days later, an examination showed several fresh hemorrhages from the horizontal vessels in both eyes. This patient afterwards died from what was probably cerebral hemorrhage, as she was paralyzed on the left side and died comatose.

Case eighteenth was one of monocular retinitis albuminurica in a woman, 39 years of age. In the right eye there was a general haziness of the fundus, and the veins were engorged and tortuous. In the left eye, below and between the nerve and the macula, was a yellowish mass of exudation in the deeper layers of the retina, from which radiated streaks or lines of the same colour. Just above the main mass of exudation were several hemorrhagic spots of varying size, and one or two small, punctate extravasations upon the optic disk. This woman had both hypertrophy and valvular disease of the heart, and her urine contained both albumen and casts.

In going over these eighteen cases hastily, we see that in eleven cases of retinal hemorrhage there was valvular disease and hypertrophy of the heart. In one case of hemorrhage, there was hypertrophy of the heart, but no valvular disease. In five cases there were no hemorrhages in the retina, and no cardiac disease of any kind. And finally in only one case was there retinal hemorrhage without at the same time cardiac lesion. These results, though taken from a small number of cases, seem to bear out the opinion already expressed, that retinal hemorrhages rarely accompany retinitis albuminurica, unless the renal disease is complicated by disease of the heart.

No. 214 West 44th Street, N. Y.

ART. IV.—*On Laparotomy, or Abdominal Section, as a Remedy for Intussusception; with Tables showing the Results of the Operation in cases of this Affection, and in those of other forms of Acute Obstruction of the Bowels.* By JOHN ASHHURST, Jr., M.D., Surgeon to the Episcopal Hospital, Surgeon to the Children's Hospital, etc.

IN my work on the *Principles and Practice of Surgery*, published in 1871, I expressed an unfavourable opinion of the operation of abdominal section in cases of intussusception or invagination of the bowels, though I added that I regarded it as a perfectly legitimate and proper procedure in cases of acute intestinal obstruction from other causes. The recent publication by Mr. Jonathan Hutchinson¹ of the history of a successful

¹ Med. Times and Gazette, Nov. 29, 1873, and Am. Journ. Med. Sci., January, 1874, p. 257.

operation of the kind in question, has led me to reconsider the subject, and to look more fully than I had previously done into its literature; and as a result of this further reflection and research, I feel bound to say that I can no longer consider the operation as never justifiable, though I still think that it can only be properly resorted to in very exceptional cases.

In the following pages I purpose to lay before the readers of this Journal some account of the cases in which the operation has been heretofore performed, and to endeavour to point out under what circumstances it may be resorted to with a reasonable prospect of benefiting the patient. It is at best a doubtful mode of treatment, and as such even the Celsian doctrine would not permit its adoption in any case not otherwise hopeless.

Laparotomy,¹ or abdominal section, is commonly said to have been first suggested as a remedy in cases of intussusception by Praxagoras, of Cos, one of the Asclepiadæ, who flourished about three and a half centuries before the Christian era. This statement is made on the authority of a passage in Cælius Aurelianus² (for no writings of Praxagoras himself have come down to posterity), but Hévin,³ who wrote against the operation in the last century,⁴ declares that the passage has been misinterpreted,⁵ and

¹ *Laparotomy*; from *λαπάρα*, the soft part of the body below the ribs, and *τεμνω*, I cut; the term *gastrotomy* is objectionable as being also applicable to the operation of opening the stomach. *Enterotomy* is an operation which aims exclusively at the formation of an artificial anus; it consists in making an incision, usually in the right iliac region, and opening the first portion of intestine which presents itself. *Colotomy* is an enterotomy practised upon the colon, and may be done either anteriorly or posteriorly. *Laparotomy* is distinctively an *exploratory operation*, and may or may not involve an incision into the bowel; when it does so, the term *laparo-enterotomy* is sometimes employed by systematic writers.

² *Acut. Morborum*, Lib. iii., cap. xvii. (Amst. 1722, p. 244).

³ *Mém. de l'Acad. de Chirurgie* (Paris, 1819), t. iv. p. 264.

⁴ According to Ducros (*Archives Gén. de Médecine*, Aout, 1838, p. 461), Hévin in a posthumous memoir, published in 1836, took a diametrically opposite view of this question, and strongly advocated the operation in certain cases.

⁵ The passage is no doubt an obscure one, but M. Hévin seems to me to have still further darkened counsel by his interpretation of it. Praxagoras, Aurelianus has been saying, employed emetics until he caused the vomiting of feces; some, after vomiting, he bled, and filled with wind through the anus, as advised by Hippocrates, and again, following Hippocrates, ordered the giving of sweet wine, etc. He then adds: "Some, in whom the intestine which the Greeks call the *blind gut* had, being filled with much fecal matter, slipped into the scrotum, he, pressing the bowels with his hands, vexed with great shaking. In some again, the above-named remedies having been exhausted, he advised that the belly should be divided even to the pubes (*dividendum ventrem probat pubetenus*); he said also, coming to impudent (*protervam*) surgery, that the rectum should be divided, and sewed up again when the feces had been withdrawn." The first paragraph which I have quoted no doubt indicates a rough kind of taxis in cases of scrotal hernia, but the second seems to me, by every fair interpretation of the text, to refer not merely to cases of hernia but to cases of the "iliac passion"

that Praxagoras merely taught the proper use of the knife in cases of strangulated hernia. Be this as it may, there is no evidence that the Greek Surgeon ever himself performed the operation, and the next reference to it appears to date back no further than the latter part of the seventeenth century, when Paul Barbette,¹ a surgeon of Amsterdam, after describing the symptoms and pointing out the often hopeless character of intussusception, asks "whether it would not be better, having made a dissection of the muscles and peritoneum, to take the intestine with the fingers and draw it out, than to abandon the patient to certain death?" Commenting upon this passage, Bonetus gives the details of what I think must be considered as the first recorded case of laparotomy for intussusception.² Hévin, indeed, rejects this case because it was communicated to Bonetus by a non-professional person (a clergyman of Geneva, who had long been intimate with the patient), and therefore was no doubt, he says, a simple herniotomy; but surely Bonetus was anatomist enough to know the difference between the two operations, and would not have adduced a case of the one as an example of the other. If we accept the case as genuine at all, we must, to be consistent, likewise accept Bonetus's interpretation of it.

CASE I.³—Baroness L—, suffering from ileus, was looked upon as being beyond remedy; there presented himself a young surgeon, who had long followed the camps, who promised certain safety if only the noble patient would submit to the making of an incision in her abdomen. She having consented, the surgeon went to work, and having drawn out and unrolled many intestines before the twisting and doubling up (*convolutio et contortuplicatio*) appeared; having by chance found this, he unfolded it, and loosed the knots, and afterwards restored it to its position. From this time, having sewed up the belly, he consolidated the wound with the happiest success, and restored the noble lady to entire health.

It is satisfactory to know that the grateful patient rewarded the skilful operator by conferring upon him an annuity, which, unhappily, he only lived to enjoy for three years.

The second recorded case, which also terminated successfully, is known as Nuck's, but it does not appear that this distinguished anatomist him-

generally. Certainly the ordinary operation for scrotal hernia does not consist in dividing the belly even to the pubes. M. Hévin's suggestion that perhaps the expression *rectum intestinum*, in this passage, does not mean the rectum, seems hardly worthy of contradiction.

¹ Anatom. Pract. Lib. iv., cap. i.—I have not been able to refer to Barbette's work, but the passage is quoted by both Bonetus and Hévin.

² Dr. Samuel Whitall, of New York, in an interesting memoir on the operative treatment of intestinal occlusion in general (*N. Y. Med. Journal*, August, 1873), quotes this case, from a recent thesis by Delaporte, of Paris, as one of *volvulus* or twisting of the bowel; Bonetus himself however gives it as an example of *intussusception*, and it is so cited by Velse, in connection with Nuck's case to be presently referred to.

³ Bonetus, *Sepulchretum*, t. ii. p. 228 (Genevæ, 1700).

self performed the operation, though it was done at his instance, and under his direction. An account of this case, the authenticity of which seems never to have been doubted until within the last fifty years, is given in the seventh volume of Haller's *Anatomical Disputations*, in the Inaugural Thesis of a certain Dr. Cornelius Henry Velse, on the authority of a pupil of Nuck, "a most truthful man and worthy of all confidence, H. Oosterdyke Schacht." In commenting upon the case recorded by Fuchsius, which will be considered hereafter, Dr. James Johnson, or one of his collaborators, says: "Our author informs us that Nuck performed a similar operation, as recorded in Haller's disputations. We have searched for the case, but could not find it;"¹ and Dr. Stephen Rogers, of New York (who by a curious coincidence misspells Fuchsius's name in the same way as his English predecessor), adds: "I have also searched for it with no better success. I therefore regard it as doubtful."² A community of ill luck in research which can only be accounted for by supposing that both investigators looked in the wrong work—perhaps in the seventh volume of Haller's collection of *Medical* disputations, instead of in the corresponding part of his *Anatomical* series. Nuck's case is as follows:—

CASE II.³—When, indeed, a woman fifty years old, worn out with the symptoms of this most cruel disease [intussusception], obtained relief by no remedies, whether enemata, fomentations, poultices, or the application of huge cups to the abdomen, which were successively employed by the celebrated Nuck; he, most happy in practice, suspecting the existence of invagination, caused a most skilful surgeon to make an opening in the abdomen four fingers' breadth from the umbilicus and in an oblique direction backwards and downwards, to draw out the intestines (which were without delay warmed with tepid milk), to search for the seat of intussusception, to disentangle this slowly, presently to replace all the intestines, and at length to sew up the abdominal wound.

By this bold operation, and Nuck's judicious after-treatment, the patient, we are told, "was, as it were, snatched from the throat of death," and survived twenty years. It is particularly mentioned (and this is a point of some importance) that at the operation the bowels were found "not yet inflamed, nor adherent (*inflammata needum, nec coalita*)."

The third case, in chronological order, is reported with full details by Dr. F. A. Fiedler, as having occurred in the practice of General-Staff-Surgeon Professor Ohle, of Dresden. The patient died from exhaustion and peritonitis a few hours after the operation.

CASE III.⁴—The patient was a man fifty years old, who, though of a strong constitution, was very irritable, and had suffered periodically, since March, 1810, from hemorrhoidal colic, with blind, and sometimes bleeding, piles. A year before he had had a severe nervous fever, accompanied with obstinate constipation, and had since often complained of difficult defecation, which was

¹ *Medico-Chirurgical Review*, N. S., vol. iii. (London, 1825), p. 539.

² *Trans. N. Y. State Medical Society* for 1872, p. 323.

³ Haller, *Disputat. Anatom. Select.*, vol. vii. (Gottingæ, 1751), p. 126.

⁴ *Magazin für die gesammte Heilkunde*, herausg. v. J. N. Rust; Bd. ii. s. 253 (Berlin, 1817).

always attended with a feeling of fulness and straining in the left side of the abdomen. This colicky condition with constipation and difficult micturition continued more or less until July (being, however, usually relieved every three or four days by mild laxatives, or by antispasmodics and anodynes, with oily inunctions, fomentations, and enemata), but from that time until September was entirely absent. The patient was, by his occupation, unfortunately, constantly exposed to the risk of catching cold, and after long exposure his disease returned with abundant bloody stools. After being again chilled about the 6th of October, fever set in, with shivering, tenesmus, constipation, and dysuria, which could be relieved neither by the remedies which had previously been employed, nor by the application of leeches to the fundament. Although there had been no passage for four days, the belly was swollen only in the right hypochondriac and iliac regions, while there was pain on slight pressure especially in the undistended portions. The pulse was almost, if not quite, normal. All medicines were vomited, but not drink. The patient complained of a tumour which completely filled the cavity of his rectum, and by the constant and violent straining was forced down to the anus. Here lay the lower end of an everywhere unattached tumour, which descended by the left side of the promontory of the sacrum, and by efforts at urination and defecation was readily protruded to the extent of about half an inch; its body, on the side of the bladder, felt smooth, but behind, in the hollow of the sacrum, rough and uneven, and its base, which could hardly be reached by the finger, seemed indented and as if covered with a membrane. In spite of the persistent use of emollient poultices, with anointing of the belly, the injection of demulcent decoctions into the rectum, and the inward administration of an oily emulsion with laudanum, the tumour remained without change. All the symptoms became aggravated, especially the colicky pain, which was accompanied with troublesome straining, and which, always beginning in the left flank and spreading over the whole abdomen, was only mitigated by vomiting. The patient now took calomel and opium, and in the intervals lenitive electuary, with enemata; the belly was alternately rubbed with camphorated ointment of marshmallow and soap liniment. A bougie was introduced into the rectum so as, if possible, to push up the tumour, but all these experiments proved fruitless, as did the employment of a bath with inunctions on the 12th of October, and injections of decoction of hyoscyamus with laudanum, and clysters of decoction of tobacco and tobacco smoke. An attempt was also made to draw out the tumour with forceps wrapped with sticking-plaster, on the 14th of October, but as fruitlessly as the pushing back of the same into the rectum, whereby it seemed as if the finger, squeezed into the inch-wide cavity of the tumour, was grasped by this, and surrounded by a cool stream of air.

At last, on the 15th of October, Dr. Ohle was called in consultation, and immediately made a close examination of the rectal tumour. This had the smoothness of bowel, was indented on its posterior surface, measured about three inches transversely, and on its anterior surface, sweeping towards the anus, had the form of the segment of a ball. In its middle was a blind sinus into which the point of the forefinger entered. The left side of the belly was flattened, but all the rest swollen. The vomiting after taking medicine or drinking, as well as after each paroxysm of pain, gave the patient great relief. The pulse was nearly normal, the respiration free, and the skin everywhere of a proper temperature. At each periodic return of the straining, the tumour was violently forced downwards. The urine was of a brownish-red colour, and deposited a red sediment. All these signs, taken in connection with the history of the case, indicated an intussusception of the colon, wherefore Dr. Ohle tried first the taxis, but without any result.

On the 17th of October the tumour was, upon the repeated entreaties of the patient, who looked upon it as a great mass of hemorrhoids, cautiously opened with a knife by a certain surgeon without the cognizance of the other medical attendants; only a little hemorrhage followed, and soon stopped of itself. Shortly after, the physicians found not only the tumour driven out by straining, with its rough covering of mucous membrane, but they saw also five dark-red epiploic appendages protruded from the yet recent wound, and felt among them

a portion of small intestine—Ohle thought of the jejunum—whereby the existence of a true intussusception of the colon was plainly enough revealed.

As all the remedies hitherto employed had proved unavailing, Ohle, with the consent of the patient and of the other physicians, undertook laparotomy the same afternoon.

After the bladder had been emptied by means of a catheter, and the patient placed almost on his right side, the line of incision was marked with India ink, out of the course of Poupart's ligament and of the left femoral and epigastric arteries, extending from the junction of the cartilages of the second and third false ribs to a point one inch above the anterior superior spinous process of the ilium, $5\frac{1}{2}$ inches long, and parallel to but $3\frac{1}{4}$ inches¹ from the linea alba. The skin and external oblique muscle having been divided, and a small artery tied in the upper angle of the wound, an opening was made through the remaining muscles and the peritoneum, and enlarged upwards and downwards with scissors and a probe-pointed hernia-knife.

As the edges of the wound were somewhat drawn apart by an assistant, the transverse colon, distended with gas, deeply congested, and a little displaced to the left, appeared at the upper part of the incision, together with the gastro-colic omentum. While Ohle, with his oiled left hand in the abdominal cavity, traced up the transverse colon from its projecting part to the seat of intussusception, the greater part of the colon, with the small intestines, protruded from the left side of the wound, but were gently held back by an assistant with linen soaked in warm water. Meanwhile, since, on account of the tightness of the invagination, disentanglement could not be effected without force, another surgeon pushed the tumour up from below through the rectum, while Ohle himself, after cautiously separating the adhesions in the whole periphery of the intussusception, and joining his fingers on both sides, with his right hand gently withdrew the invaginated colon, and gradually unfolded it. The length of the adherent colon was almost twelve inches. In the blind end of the cæcum lay a portion of displaced jejunum, which, like the descending colon, was much inflamed and abnormally thickened. The inch-long transverse wound which before the laparotomy had been made in the flexure of the colon, was now closed by a bowel suture and held by an assistant with a waxed thread passed through the left mesocolon, in order that the protruded portion should be replaced and the edges of the wound reunited with a knotted abdominal suture. The ligature and suture threads were, as well as the abdominal dressings, fastened with sticking-plaster, Ohle's uniting bandage being then applied, and the whole covered with a fourfold compress steeped in warm oxycrat (vinegar and water). The patient was placed almost on his right side, given ten drops of Sydenham's laudanum, and allowed an occasional drink of almond emulsion. Two hours afterwards he complained of a fixed pain at the lower part of the wound; his pulse became small and quick; he suffered great thirst; but his temperature was not abnormal. In six hours he had a soft, and very offensive stool, and at night was hot, restless, and delirious. His pulse failed rapidly, his breathing became difficult, but his pain was relieved. Involuntary evacuations followed, and the patient died towards morning with a gradual aggravation of all his symptoms. A *post-mortem* examination made thirty hours after death revealed general peritonitis, with an inflamed and gangrenous condition of the part of the bowel which had been implicated in the invagination.

The above case I have given at some length, as it appears never to have been published either in England or in this country. A fourth, and the third recorded *successful* instance of laparotomy for intussusception, was communicated by the operator, Dr. Fuchsius, to Hufeland's Journal for February, 1825. An extract of this case appeared in Johnson's *Medico-Chirurgical Review* for the same year, and its chief features have also

¹ Erroneously stated in the text as $\frac{3}{4}$ inch, but correctly given in the account of the autopsy.

been reproduced by Dr. Stephen Rogers, in his paper read before the New York State Medical Society, and already referred to.

CASE IV.¹—The patient was a strong and healthy man, 28 years old, who, while at work, was suddenly seized with violent pain in the region of the umbilicus. With great difficulty he succeeded in reaching his home, where he lay down in the open-air and went to sleep; on awaking, he vomited some mucus, and felt relieved; in the evening his bowels were moved, but not freely. During the night the pain was bearable, but returned periodically. The next day the symptoms were aggravated, paroxysms occurring every twenty or thirty minutes, and lasting five minutes at a time. The corporation-doctor who was called in now prescribed cathartics and enemata, and bled the patient from the arm; temporary relief was obtained, but in the evening the pains recurred with increased frequency. No passage was obtained from the bowels, but large quantities of wind were brought up by eructation after every paroxysm. Anodynes were now administered, and camphorated ammonia liniment was applied to the abdomen, while frequent lukewarm baths were also employed, and the enemata continued. Fuchsius was called in consultation on the fifth day, and on the seventh, finding that no improvement had followed the various remedies employed, suggested an operation; this, however, was not permitted by the patient until the tenth day, when, in addition to the previously mentioned treatment, six ounce doses of metallic mercury had been fruitlessly tried. The operation consisted in making a small opening about two inches above the position of the umbilicus and in the line of the outer border of the right rectus abdominis muscle, the wound being subsequently enlarged with a probe-pointed bistoury to the extent of seven or eight inches. Introducing his oiled hand into the cavity of the abdomen, Fuchsius discovered an intussusception, but found that he could not reach the point at which it began without making a transverse incision from the right to the left of the belly; rather than do this, he determined to open the bowel itself at the lower end of the intussusception, and by introducing his finger into the gut to effect reduction by gradually pushing the invaginated portion from below upwards. In this manner he succeeded in relieving the intussusception which involved a portion of intestine over two feet in length. A large round worm was found in the opened bowel, but there was no trace of inflammation nor any abnormal condition. The intestinal wound was closed with a continued suture of silk, the ends being brought through the external wound, which was itself closed with the ordinary interrupted suture. Convalescence was satisfactory, the bowels being spontaneously moved on the night of the second day, and the patient having entirely recovered by the fourteenth day after the operation.

The next case appears to have been the first in which laparotomy was practised for intussusception in a child. The operator was Gerson, and the case was communicated by him to Dr. Hachmann, of Hamburg, by whom it is reported.

CASE V.²—The patient was a male infant, twelve weeks of age, and was seen by Dr. Gerson on Sept. 18, 1828. In addition to symptoms of obstruction there was hemorrhage from the bowels, and a tumour was recognized in the inguinal region as well as by digital exploration of the rectum. An oblique incision was made in the direction of Poupart's ligament, beginning about two fingers' breadth from the anterior spine of the ilium and passing inwards. As soon as the abdominal cavity was opened, a bunch of invaginated intestines was found in the left inguinal region; the adhesions were very firm, yet it was possible to draw out about an inch of the invaginated portion in a tolerable condition,

¹ *Journal der Practischen Heilkunde*, herausg. v. Hufeland und Osann, lx. Band, ii. Stück, s. 42.

² *Zeitschrift für die gesammte Medicin*, herausg. v. Fricke u. Oppenheim, Bd. xiv. (1840), s. 303.

that which followed being of very thin calibre, about the thickness of an adult processus vermiformis; after about a foot's length had been thus disengaged, without materially diminishing the thickness of the mass, the bowel gave way under traction, at a gangrenous part. The operation was under these circumstances abandoned; the little patient remained lively for a while, but died about six o'clock in the afternoon.

The only case, so far as I know, in which laparotomy for intussusception has been resorted to in this country, occurred in the practice of Dr. John R. Wilson, of Tennessee, afterwards of Mississippi, and was communicated by his pupil, Mr. W. W. Thompson, to the *Transylvania Journal of Medicine and the Associated Sciences* for 1835.

CASE VI.¹—The patient was a negro, 20 years of age, who for seventeen days had suffered from symptoms of intestinal obstruction. There was stercoraceous vomiting, but no mention is made of intestinal hemorrhage. The treatment had consisted in the administration of active purgatives and metallic mercury. The operation consisted in making an incision five inches in length in the linea alba, the umbilicus being about the middle of the wound. The bowels protruded, and the seat of obstruction was found in the ileum. Disinvagination was effected by grasping the intestine above and below, and forcibly rupturing the adhesions, which were quite firm. The bowel and omentum were deeply congested, and "seemed to be on the verge of mortification." The wound was closed with sutures and adhesive strips, and the patient placed in bed. "His recovery was rapid and entire."

The next case in chronological order is that of Hauf or Hauff, which was published in the *Heidelberg Medical Annals* for 1842. I have not been able to refer to the original report, and therefore give the operator's name on the authority of Adelmann² and Leichtenstern,³ both of whom include the case in their tables. Dr. Whitall erroneously cites the case as Krug's, the fact being that Krug was merely the compiler who furnished an account of the case to *Schmidt's Jahrbücher* for 1843.

CASE VII.⁴—The patient was a man, 36 years of age, not large, but strongly built, of an atrabilious constitution, "a good worker, but a still better eater and drinker." In the month of May, while overheated, he drank cold, sour, unfermented wine, and was immediately seized with violent colic, which forced him to roll on the ground and cry aloud. This lasted with little interruption for more than a month, until in July the patient finally allowed himself to be taken to the hospital. At this time he was jaundiced and somewhat emaciated, and at varying intervals suffered from violent colicky pains of greater or less duration; he had from two to eight stools daily, passing coagulated blood, pus, and mucus, mixed with fecal matter, but the latter only in small particles. The belly was not distended, but sometimes in one place, sometimes in another, though particularly in the left hypogastric region, were felt isolated sausage-shaped swellings two to four inches long, one such almost constantly corresponding in position with the sigmoid flexure. These gave a clear tympanitic sound on percussion. The belly generally felt tight, and was sensitive, partic-

¹ *Transylvania Journal of Medicine*, vol. viii. p. 486, and *Am. Journ. of the Med. Sciences*, vol. xviii. (O. S.) p. 262.

² *Vierteljahrsschrift für die praktische Heilkunde* (Prag.), Bd. lxxviii. (1863), s. 42.

³ *Ibid.*, Bd. cxxi. (1874), s. 45.

⁴ *Heidelb. Med. Annal.*, Bd. viii., s. 428, and *Schmidt's Jahrbücher*, Bd. xl. (1843), s. 214.

ularly at the localities of the above-mentioned swellings. There was no fever, urination was regular, and the appetite was good, though taking food sometimes caused pain in the abdomen; nothing abnormal was discovered by careful exploration per anum. The disease was, therefore, regarded as chronic enteritis with ulceration of the mucous lining of the bowel, and leeches were applied to the belly, oily emulsions given, and enemata of cold flaxseed mucilage. Some relief was obtained by these measures, but the condition of the abdomen and the stools remained the same. For the intestinal swellings, which under the finger could be felt to vary in size with the peristaltic motions, assafoetida emulsions were given, cold fomentations applied to the belly, and enemata of cold water administered. Rectal exploration still gave a negative result. The condition of the patient now yet further improving, he left the hospital, and was not again heard from until October, having in the interval felt tolerably well, though his pains occasionally returned, and though he frequently had a sensation of some obstruction in the rectum; digital exploration now revealing the presence of a round soft body the size of a walnut. One night, after the patient had plentifully indulged in new wine, and had subsequently become chilled, the pains and straining recurred, and this rectal body sank lower, and more than once, under violent straining, protruded as a dark-red tumour the size of an apple. The belly was now distended and tympanitic, but not very tender, and the tumour in the left hypogastric region was again conspicuous. Two and a half inches within the rectum was found a rosette-like soft tumour, the size of an apple, nearly filling the pelvis. The finger passed all around it, and at its middle was an opening, which was formed by a hard stricture feeling like a hard lip of the os uteri. The rectum itself was normal, and the tumour not painful, but there was a discharge of bloody mucus from the anus. The tumour, recognized as an invaginated portion of bowel, was readily replaced through the stricture, with relief to the patient. On the next morning, however, the protrusion recurred, with tenesmus and discharge of bloody mucus, and the tumour, now harder, more tense, and closely embraced by the stricture, could not be replaced. Incessant vomiting followed, with hiccough, great meteorism, a small, quick pulse, Hippocratic countenance, and most violent pain in the enlarging tumour, which in size and hardness resembled that produced by a child's head entering the pelvis. Three days later a completely gangrenous portion of empty large intestine protruded from the rectum, from which flowed an offensive liquid. Reposition was now easy; no hard tumour could be felt, and no stricture, but only a kind of pouch, which came down again as often as it was pushed up; vomiting had ceased, but there was no action from the bowels; the belly was distended, and the tumour of the left side felt like a degenerated ovary. By the wish of the patient laparotomy was now undertaken, not with a hope of relieving the invagination, for the bowel must long since have become gangrenous, but that the patient might perchance be saved by the formation of an artificial anus. An incision three inches long was made from below upwards and outwards, two inches above Poupart's ligament and four inches to the left of the linea alba. As soon as the peritoneum was cautiously opened, a pint of clear, yellow, inodorous fluid instantly spirted out in a stream; the peritoneum was bluish, and one inch thick. The wound having been enlarged, the finger immediately came upon a stony-hard, sausage-shaped tumour, and at all accessible points were hard knotted rolls the thickness of the finger. The surface towards the operator was of a dusky bluish-red colour, and manifestly consisted of intestine with greatly thickened walls. No cavity was reached by a deeper incision, and by a still deeper wound it appeared that only a thickened intestinal wall, closely compressed by another portion of bowel lying posteriorly, was cut through, behind which the latter was plainly revealed just as the former had been by the first incision. The finger felt on all sides the already-described knots, and innumerable adhesions; in separating these the contents of the bowel escaped from the wound, but the point of rupture was in vain sought for. The operator now wished to divide the tumour transversely, but after he had cut into it to the depth of an inch without finding the cavity of the bowel, he abandoned all further search, arrested the hemorrhage, and placed the ligatures with a tent in the lower angle of the wound. The

operation occupied half an hour. The following night was tolerably peaceful; there was no vomiting, but severe pain. The next morning a large quantity of fecal matter and intestinal mucus appeared at the wound, and the finger found the tumour as on the day before; the belly was distended and tympanitic; and the gangrenous intestine protruded about six inches beyond the anus. This [gangrenous mass] was cut out from the rectum at as high a point as could be reached with scissors. These symptoms continued without much change, fecal matter passing from the wound and a little from the anus, and the patient complaining less of pain than of unquenchable thirst, and retaining perfect consciousness until his death on the ninth day after the operation. A *post-mortem* examination showed the bowels and omentum matted together in the hypogastric region; the whole intestinal canal, and especially the stomach, distended with air and of a bluish-red colour; the tumour behind the abdominal wound dusky bluish-red, very hard, six inches long and two or three thick, and the three incisions which were made at the time of the operation gaping, without any attempt at repair, and with feces at their deepest parts. The whole mass consisted evidently of three portions of bowel invaginated together, the beginning of the intussusception being in the ileo-colic region. The lower third of the ileum formed the beginning of the invaginated portion, and a part of the cæcum with the appendix vermiformis, contracted, dark-red, and adherent on all sides, formed the innermost part of the tumour. The invaginated ileum, on the other hand, was but little reddened, and not much altered. The next part involved in the invagination was the descending colon, which was drawn over to the right, and passed immediately into the sloughing, dark crimson, ulcerated rectum. The walls of all the above-named portions of intestine were much hypertrophied. In the cavity of the pelvis all was adherent and bluish-red in colour, and it could not be ascertained to which portion of the large intestine the part removed by sloughing had belonged, nor in what manner fecal matter could have reached the anus, since nowhere was any channel to be found which was sufficient for the purpose. The rest of the bowels were pushed out of place, the omentum and mesentery thickened in parts, the liver and gall-bladder very large but healthy.

All the cases hitherto considered, with the exception of Gerson's, occurred in adults; the next occurred in an infant, and is reported by the operator, Mr. Spencer Wells.

CASE VIII.¹—The patient was a child four months old, and symptoms of intussusception had lasted more than four days when the operation was resorted to, injections, insufflation of air, and the use of a sponge-probang having previously failed to relieve the invagination which could readily be felt by introducing the finger into the rectum. An incision two inches long was made in the median line, just below the umbilicus, and disinvagination was effected with some difficulty. Acupuncturation of the intestine was also practised to relieve its distension. The child was almost moribund when the operation was begun, and actually died five hours after its termination.

Of the three next cases I am able to give but few details; one of them has, I believe, never been published, and the other two I know only from the tables of Adelman and Leichtenstern.

CASE IX.²—The operator in this case was Pirogoff. The patient was a lad, sixteen years of age, and the symptoms of obstruction were of considerable duration. The invaginated portion of bowel was found in a gangrenous condition; the gut was opened, and its edges attached to those of the external wound. Death occurred shortly after the operation.

¹ Trans. Path. Society of London, vol. xiv. (1863), p. 170.

² Vermischte Abhandlungen aus dem Gebiete der Heilkunde, St. Petersburg, 1852, s. 150; quoted by Adelman (*loc. cit.*, p. 44), and by Leichtenstern (*loc. cit.* p. 45).

CASE X.¹—The operator was M. Laroyenne, of Lyons. The age of the patient is not mentioned. Disinvagination was impossible on account of the existence of adhesions. The case terminated fatally.

CASE XI.²—This case, which occurred in the practice of Mr. Athol Johnstone, appears never to have been published; it was referred to by Mr. Holmes in the discussion which followed the reading of Mr. Hutchinson's case before the Royal Medical and Chirurgical Society of London. The patient was a child, and the case terminated fatally.

In the next case the operator was Prof. Weinlechner, of Vienna; I have not been able to refer to the original report by Dr. Maximilian Herz, and have, therefore, taken the facts of the case from the abstracts in Schmidt's *Jahrbücher* and in Hayem's *Revue des Sciences Médicales*.

CASE XII.³—The patient, a female infant of six months, was suddenly attacked in the night with violent colicky pains, followed by a slightly bloody stool. There was another paroxysm the next morning, and from this time the discharges consisted almost exclusively of bloody mucus, while food was vomited as soon as it was taken. On the following day a tumour was felt in the left hypogastric region, and was recognized as an intussusception of the descending colon. No information was gained by a digital exploration of the rectum. Prof. Weinlechner operated on the morning of the fourth day without the aid of chloroform; an incision three inches long was made over the tumour, and the peritoneum cautiously opened upon a grooved director. The invaginated portion was found to consist of the extremity of the ileum, the cæcum, and processus vermiformis, and the ascending and transverse colon; the tumour measured three inches in length, and about two fingers' breadth in its other dimensions. The parts were very much congested, and disinvagination and reposition were effected with great difficulty. The wound was closed with twelve sutures, and cold compresses applied; but the child died six hours afterwards in convulsions, a post-mortem examination revealing the existence of acute peritonitis.

The last case to be considered is that reported by Mr. Hutchinson; it has been so recently published in this Journal, that a very brief reference to it will be sufficient.

CASE XIII.⁴—The patient was two years old, and the intussusception had been a month in forming. Its extremity, presenting the inverted ileo-cæcal valve, protruded several inches beyond the rectum. The abdomen was opened in the middle line below the umbilicus, and disinvagination was effected without difficulty. Recovery was rapid. This case is quoted by Leichtenstern from the Transactions of the first Congress of the German Surgical Association, held at Berlin in 1872; but the age of the patient is incorrectly given as four years, and the operation is said to have been performed on the tenth day. This case is also referred to by Mr. Waren Tay, in the Biennial Retrospect of the New Sydenham Society for 1869-70 (p. 295).

¹ Servier, De l'occlusion intestinale, 1870; Leichtenstern, *loc. cit.*

² Holmes, in British Medical Journal, Dec. 6, 1873, p. 661.

³ Oesterr. Jahrbuch für Pädiatrik, Bd. i. (1872); Schmidt's Jahrbücher, Bd. clvi., s. 119; and Revue des Sciences Médicales, t. i., p. 218 (Paris, 1873).

⁴ Med. Times and Gazette, Nov. 29, 1873; Brit. Med. Journal, Dec. 6, 1873, and Am. Journ. of the Med. Sciences, Jan. 1874, p. 257.

Tabular view of Thirteen Cases of Laparotomy for Invaginated Bowel.

No.	Sex and age of patient.	Operator.	Symptoms before the operation.	Duration of disease.	Result.	Duration of life after operation.	Remarks.
1	Female, adult	Military surgeon referred to by Bonetus	Symptoms of "Ileus"	Not mention'd	Recovered	....	Case rejected by Hévin, but accepted by Velse.
2	Female, aged 50 years	Surgeon employed by Nuck	Not specified	Not mention'd	Recovered	....	Patient was "worn out" by her sufferings; enemata, etc., failed to give relief; bowels not inflamed nor adherent.
3	Male, aged 50 years	Ohle	Symptoms of obstruction, with vomiting, great pain, and hemorrhage from the bowels	11 days	Died	About 12 hours	The intussusception, which protruded from the rectum, had been previously cut into. Autopsy showed peritonitis and gangrene of bowels.
4	Male, aged 28 years	Fuchsius	Symptoms of obstruction merely	10 days	Recovered	....	In order to effect disinvagination, it was found necessary to open the bowel.
5	Male, aged 12 w'ks	Gerson	Symptoms of obstruction with hemorrhage from the bowels	Not mention'd	Died	A few hours	Bowel ruptured, and operation abandoned.
6	Male, aged 20 years	Wilson	Symptoms of obstruction merely	17 days	Recovered	....	Firm adhesions; parts much congested.
7	Male, aged 36 years	Hauff	Symptoms of obstruction, followed by peritonitis, with hemorrhage from bowels, and gangrene of mass which protruded from rectum	Several days	Died	9 days	Bowel ruptured and operation abandoned.
8	Child aged 4 mos.	Spencer Wells	Not specified	4 days	Died	5 hours	Child almost moribund at time of operation.
9	Male, aged 16 years	Pirogoff	Not specified	Symptoms of considerable duration	Died	Died shortly after operat'n	Gangrene of bowel; an artificial anus was made.
10	....	Laroyenne	Not specified	.....	Died	....	Adhesions prevented disinvagination.
11	Child	Atthol	Not specified	.....	Died	....
12	Female, aged 6 mos.	Weinlechner	Symptoms of obstruction, with great pain, vomiting, and hemorrhage from the bowels	3 days	Died	6 hours	Died in convulsions; peritonitis found at autopsy.
13	Female, aged 2 years	Hutchinson	Symptoms of obstruction merely. Intussusception protruded from anus	1 month	Recovered	....	Disinvagination effected without difficulty.

I have in the preceding pages brought together, with more or less detail, the histories of thirteen cases in which laparotomy, or abdominal section, has been undertaken for the relief of intussusception. This number is I believe larger than that collected by any previous writer, and, though too small to be of much value for statistical purposes, is sufficient to enable us to draw some conclusions of value as to what cases may hereafter be submitted to this mode of treatment with a reasonable hope of benefiting the patient.

An inspection of the table shows, in the first place, that no encourage-

ment is afforded to repeat the operation in very young infants. The only cases in which it has been resorted to during the first year of life, have all terminated fatally (Gerson, Wells, Weinlechner). But when it is remembered that of Pilsz's¹ 162 cases (all occurring in children), no less than 91 were in infants less than a year old, it will be seen how large a proportion of cases must at once be put aside as unfitted for operative treatment. It is very true that the fatality of intussusception at this early age is enormous, the mortality being according to Leichtenstern's² elaborate statistics no less than 86 per cent. But the case is very different from that, for instance, of an operation for imperforate rectum; for in this condition there is necessarily no hope but in an operation, whereas in the case of intussusception experience shows on the one hand that, even at this age, a certain number do recover without operation, and on the other hand that, as might indeed be expected, operative treatment is in such cases of no avail.

In the second place, the table shows that in what may be called *acute* cases, those, namely, in which in addition to symptoms of obstruction there are evidences of strangulation, such as peritonitis and intestinal hemorrhage, a resort to operative interference will be productive of no benefit. These cases are, on the other hand, as justly remarked by Mr. Hutchinson, precisely those in which there is most hope of recovery by sloughing of the invaginated portion. This point is well illustrated by Leichtenstern, who finds that of 557 cases of which the termination is known, sloughing occurred in 149, of which 88 ended in recovery and 61 (41 per cent.) in death, while of the 408 in which sloughing did not occur, only 63 terminated favourably and 345 (85 per cent.) in death.

There remains then a limited number of cases, in adults or at least not in very young infants, in which the symptoms are those of obstruction merely, without intestinal hemorrhage or peritonitis, and in which, when other measures fail, the question of operation may properly be considered. And here it may be said that if any operation at all is to be performed, *abdominal section* should be chosen rather than either *enterotomy* or *colotomy*: these could at best give but temporary relief, and have, I believe, never proved of permanent value in any case of intussusception; whereas *laparotomy*, as seen by the table, has already proved successful in five instances. At what period the use of enemata and other bloodless remedies should be abandoned, and operative measures instituted, must, in the absence of further experience on this point, be left to the judgment of the surgeon in each particular case.

If the cases which I have tabulated are to be used for purposes of statistical comparison, the first two (Bonetus's and Nuck's) should, I

¹ Schmidt's Jahrbücher, Bd. cxlvi., s. 178.

² Loc. cit., p. 17.

think, be left out of consideration : these were single successful cases, each occurring in a separate century, and (were all the facts known) could no doubt be over-matched by unsuccessful cases which have never been recorded. Of the eleven cases which have occurred during the present century, three terminated in recovery, and eight in death—a proportion which corresponds almost exactly with that which, as shown by Leichtenstern, obtains for all cases of intussusception taken together, for of 557 terminated cases collected by this writer, 151 (27 per cent.) ended favourably, and 406 (73 per cent.) proved fatal.

Before terminating this paper I must refer briefly to the results of laparotomy in the treatment of intestinal obstruction from other causes than intussusception. This subject has been studied statistically by several authors, among whom may be particularly mentioned, Phillips,¹ Delaporte,² Whitall,³ of New York, and Adelmann.⁴ The last named writer has tabulated 33 cases, of which, however, five are examples of intussusception. In the annexed table I have brought together 57 cases, which, with the 13 of invaginated bowel already considered, make a total of 70 cases of laparotomy for intestinal obstruction, the largest number, I believe, which has as yet been collected.

Tabular view of Fifty-seven Cases of Laparotomy for Acute Intestinal Obstruction from other causes than Intussusception.

No.	Operator.	Nature of lesion.	Result.	Reference.
1	Adelmann	Protrusion of intestine through slit in rectum	Died	Prag. Vierteljahrschrift, Bd. lxxviii. s. 42, Nro. 13.
2	"	Strangulation persisted after reduction of hernia	"	Ibid., s. 55.
3	Anderson	Strangulation by a band	"	Med. Times and Gazette, 1858, vol. ii. p. 45.
4	Annandale	" " "	"	Edinburgh Med. Journal, vol. xvi. (1871) p. 700.
5	Avery	Stricture of colon	"	Trans. Path. Society, London, vol. ii. p. 62.
6	Berndt	Volvulus	Recovered	Adelmann, Prag. Vierteljahrschrift, Bd., lxxviii., s. 42, Nro. 10.
7	Billroth	Strangulation persisted after herniotomy	Died	Archiv für klinische Chirurgie (Langenbeck), Bd. i., s. 485.
8	Borelli	Strangulation by a band	Recovered	Whitall, in N. Y. Medical Journal, August, 1873, No. 20.
9	Brodie	Protrusion of intestine through slit in rectum	Died	Lancet, vol. xii. (1827) p. 502.
10	Bryant	Strangulation by a band	Recovered	Med.-Chir. Transact'ns, vol. I. (1867) p. 65.
11	Buchanan	Volvulus	"	Lancet, 1871, vol. i. p. 776.
12	Canton	Internal strangulation	Died	London Medical Gazette, vol. xii. (N. S.) p. 78.
13	Coulson	Obturator hernia	"	Lancet, 1863, vol. ii. p. 303.
14	Curling	Strangulation persisted after herniotomy	"	Ibid., 1850, vol. ii. p. 81.
15	Depaul	Strangulation by a band	"	Whitall, loc. cit., No. 22.
16	Dieffenbach	Strangulation persisted after reduction of hernia	"	Operative Chirurgie (1848), Bd. ii., s. 439.
17	Druitt	Strangulation by a band	"	Med.-Chir. Transactions, vol. xxxi. (1848) p. 245.
18	Dupuytren	" " "	"	Leçons Orales, 2e édit., t. iii. p. 650.
19	Ericksen	Volvulus	"	Lancet, 1850, vol. i. p. 108.
20	Fergusson	"	"	Med. Times and Gazette, 1862, vol. ii. p. 435.

¹ Med.-Chir. Transactions, vol. xxxi. (1848), p. 22.

² De la Gastrotomie dans les Étranglements Internes, Paris, 1872.

³ New York Med. Journ., August, 1873, p. 113.

⁴ Loc. cit., p. 44.

No.	Operator.	Nature of lesion.	Result.	Reference.
21	Fergusson.	Adhesion of ileum to uterus	Died	System of Practical Surgery (1870), p. 651.
22	Fischer	Strangulation by omentum	Recovered	Adelmann, loc. cit., s. 46, Nro. 32.
23	Gay	Strangulation by a band	Died	Trans. Path. Society, London, vol. iii. p. 101.
24	Gross	Volvulus	"	System of Surgery (1872), vol. ii. p. 677, and private note from operator.
25	"	"	"	Ibid.
26	Hamilton	Scirrhus of colon	"	Med. Times and Gazette, 1864, vol. i. p. 88.
27	Hancock	Strangulation by a band	"	London Med. Gazette, vol. xii. (N.S.) p. 77.
28	Hilton.	Strangulation by old adhesions	"	Med.-Chir. Transactions, vol. xxx. (1847) p. 51.
29	"	Obturator hernia	"	Ibid., vol. xxxi. (1848) p. 323.
30	"	Strangulation by mesentery	"	Association Medical Journal, May 12, 1854, p. 408
31	Hoegg	Volvulus	"	Sandifort, Thesaur. Dissertat., vol. iii. p. 87.
32	Holmes	Strangulation by a band	"	Surgical Treatment of Children's Diseases, 2d edit., p. 570.
33	Hulke	" " "	"	Med. Times and Gazette, 1872, vol. ii. p. 482.
34	Jones	Strangulation persisted after herniotomy	"	Ibid., 1854, vol. ii. p. 182.
35	Larquet	Strangulation persisted after reduction of hernia	Recovered	Adelmann, loc. cit., s. 46, Nro. 33.
36	Lawson	Constriction by scirrhus mass	Died	Med. Times and Gazette, 1861, vol. i. p. 675.
37	Leopold	Strangulation persisted after reduction of hernia	Recovered	Adelmann, loc. cit., s. 44, Nro. 25.
38	Luke	Stricture of colon	Died	Trans. Path. Society, London, vol. ii. p. 218.
39	Manlove	Strangulation by old adhesions	Recovered	Boston Med. and Surgical Journal, vol. xxxii. (1845) p. 492.
40	Marcacci	Strangulation by a band	"	British Med. Journ., March 23, 1872, p. 314.
41	Monod	Constriction by scirrhus mass	Died	Archives Gén. de Médecine, 1838, t. ii. p. 455.
42	Pagenstecher	Obstruction by cyst of gall-bladder	Recovered	Archiv für klin. Chirurgie (Langenbeck), Bd. ii., s. 318.
43	Parise	Strangulation by a diverticulum	Died	Whitall, loc. cit., No. 28.
44	Pauli	Strangulation by omentum	"	Adelmann, loc. cit., s. 44, Nro. 17.
45	Phillips	"Ileus"	"	London Medical Gazette, vol. xiii. (N.S.) p. 233.
46	Pirogoff	Strangulation by a band	"	Adelmann, loc. cit., s. 44, Nro. 21.
47	Prieger	Strangulation persisted after reduction of hernia	Recovered	Ibid., Nro. 23.
48	Reali	Volvulus	"	Froriep's Notizen, 3 Reihe, Bd. ix. (1849) s. 95.
49	"	Obstruction by stick of wood in rectum	"	Prag. Vierteljahrsschrift, Bd. xxvi. s. 50 (Analekten).
50	Renault	Strangulation persisted after herniotomy	"	Archives Gén. de Médecine, 1845, t. i. p. 458.
51	Reybard	Cancer of sigmoid flexure	"	Bulletin de l'Acad. de Médecine, t. ix. p. 1031.
52	Ritter	Volvulus	Died	Adelmann, loc. cit., s. 44, Nro. 29.
53	Tessier	Strangulation by a band	"	British Amer. Journal, vol. i. (1860) p. 251.
54	White	Obstruction by teaspoon in ileum	Recovered	Journal der praktischen Heilkunde, Febr. 1811, s. 124.
55	Wood	Strangulation persisted after reduction of hernia	"	Western Lancet, vol. xiv. p. 720.
56	.....	Obstruction from intestinal concretion	Died	Monro, primus, apud Jaeger; Adelmann, loc. cit., s. 42, Nro. 1.
57	.....	Strangulated hernia	Recovered	Blancard, apud Mém. de l'Acad. Roy. de Chir., t. iv. p. 337 (éd. 1819).

NOTE.—In addition to the cases given in the preceding table, there are others attributed to Dupuytren, Jobert (de Lamballe), Malgaigne, and Velpeau, which are rejected by Adelmann, but to the original reports of which I have not been able to refer. One of Dr. Whitall's cases (No. 16, Luke) I have omitted, as being rather an operation for the formation of an artificial anus than a laparotomy; it is properly tabulated by Adelmann among his cases of enterotomy. Cheselden's operation for scrotal hernia, described by Heister,¹

¹ Inst. Chirurgicæ, tom. ii. p. 813 (Amst., 1739).

Haller,¹ and Louis,² as one of abdominal section, appears, from Cheselden's own account and illustration of it,³ to have been a simple herniotomy. I must take this opportunity of expressing my thanks to Prof. Gross for having courteously furnished me with the particulars of his two cases of laparotomy for volvulus.

Of the fifty-seven cases included in the above table, it will be seen that only eighteen terminated successfully, so that the mortality of laparotomy in cases of intestinal obstruction other than intussusception, is over 68 per cent. But the prospect of recovery without operation is in these cases much less favourable than in those of intussusception, and in some instances, as *e. g.* in cases of strangulation by a fibrous band or diverticulum, or of protrusion of the gut through an aperture in the mesentery, the patient is, humanly speaking, inevitably doomed unless saved by the knife. Hence in any case of *acute* intestinal obstruction, in which judicious medical treatment has failed to give relief in the course of three or at most four days, and in which the age of the patient and the absence of the distinctive symptoms of invagination lead to the belief that the pathological condition present is one of intestinal strangulation (which, next to intussusception, is by far the most common cause of acute obstruction), it is, I think, undoubtedly the surgeon's duty to urge an exploratory operation as the only means of saving life.

From a study of the cases referred to in the preceding pages, the following conclusions may, I think, be considered as fairly established.

I. Past experience gives no encouragement to operative interference in cases of intussusception occurring in infants less than one year old.

II. When the symptoms present, and particularly the existence of intestinal hemorrhage, render it probable that the closeness of the intussusception will lead to sloughing of the invaginated portion, no operation is advisable; for while under these circumstances an operation would almost surely fail, there is a fair hope that separation of the invaginated mass may lead to spontaneous recovery.

III. There may be, however, exceptional cases, in which, while there is no prospect of recovery through sloughing, bloodless remedies fail to give relief, and the patient is in danger of succumbing through exhaustion and long-continued suffering; under such circumstances, if the age and general condition of the patient do not forbid it, the question of operative interference may properly be considered.

IV. When an operation is determined upon, *laparotomy* should invariably be preferred to either *enterotomy* or *colotomy*; these, though suitable operations in cases of congenital occlusion and chronic obstruction

¹ Bibliotheca Chirurgica, tom. ii. p. 23 (Basileæ, 1775).

² Mém. de l'Acad. Royale de Chirurgie, t. iv. p. 336 (Paris, 1819).

³ Anatomical Tables, Tab. 39, p. 44 (Boston, 1796); and Treatise on the High Operation for Stone, Tab. xvii., p. 178 (London, 1723).

of the bowels, are unsuited for cases of intussusception or other varieties of acute obstruction.

V. In cases of acute intestinal obstruction from other causes than intussusception, should milder measures fail to give relief in the course of three or at most four days, laparotomy should be unhesitatingly recommended, and may under such circumstances be resorted to with a reasonable hope of success.

ART. V.—*On Thrombosis of the Cerebral Veins, and Sinuses of the Dura Mater.* (Second paper.) By JOHN A. LIDELL, M.D., of New York.

III.—THE traumatic and inflammatory forms of this disease, or rather the clinical history of these forms, were minutely described in the number of this Journal for January, 1874. There is, however, still another variety of thrombosis of the cerebral veins and sinuses of the dura mater, which possesses a great deal of interest and importance. It is met with only in subjects who are much weakened from want of food, or loss of blood, or profuse discharges, or broken down by the weight of years, or worn-out by some exhausting disease, that is, in marasmic subjects, without the concurrence of any local traumatic or inflammatory lesion to which the origin of the thrombus can be ascribed, and hence we have, in the *third* place, a *marasmic* variety of thrombosis that affects these veins and sinuses. It is strictly analogous to the marasmic variety of thrombosis, which sometimes presents itself in the veins of the extremities. It is of pretty frequent occurrence. It embraces rather more than one-fourth of the cases collected by Prof. Von Dusch; and almost one-fourth of those collected by the writer. It is important not only from the frequency of its occurrence, but when we closely examine the individual instances of it, and especially when we contrast them with the cases which belong to the other varieties of cerebro-venous thrombosis, we find important differences as well as numerous other points of interest. In the writer's opinion the *marasmic*, as well as the traumatic and inflammatory varieties of cerebro-venous thrombosis, has not yet received that degree of attention which it really deserves. He therefore proposes to describe it also, as fully as he can, within reasonable limits; and this description will be chiefly drawn from the history of thirty-eight cases, of which one was observed, and twenty-one were collected by Von Dusch, and an additional sixteen were observed or collected by the writer. It may here be remarked that Von Dusch styles this variety of cerebro-venous thrombosis "*thrombosis of the sinuses from debilitating influences.*" The term *marasmic* thrombosis of the above-named vessels, however, is preferable in a vast majority of instances.

1. Perhaps the most striking of all the cases belonging to this category, are those in which young children having diarrhœa, or dysentery, or cholera infantum, but especially those who are badly nourished, or have become much debilitated and shrunken in appearance from the profuseness or long-continuance of alvine discharges, rapidly sink into a state of unconsciousness, with or without convulsions, and thus after a time expire. Dr. Gerhard (Von Dusch's *Memoirs*, New Sydenham Soc. Ed., pp. 111-114) relates four cases of this sort. They all occurred in very young, artificially fed children, and agree very closely with each other. Take the following as a fair example of the clinical phenomena and post-mortem appearances.

A well-fed boy, three months old, was seized with profuse diarrhœa; greater fontanelle flat, and pulsating strongly; temporal and frontal veins very prominent; both jugulars much and equally distended. He lies quietly, with an unconscious stare, and occasional strabismus; both pupils equally dilated. Then there followed complete unconsciousness, opisthotonos with rigidity, sinking of the fontanelles, overlapping of the skull bones, convergent strabismus, etc.; the left external jugular became more distended; then the right external jugular enormously so, while the left one appeared almost empty; left side of face slightly paralyzed; left pupil more dilated; after some transient improvement, death on the eleventh day. *Autopsy*.—Superior longitudinal sinus, filled with fluid blood and recent coagula, anteriorly. A knobby, discoloured, firm thrombus in posterior part; it also extends into both lateral sinuses, and causes them, especially the left, to appear externally like thick, roundish hard cords; in the left it is partially adherent, and completely fills the sinus; in the right not. Hyperæmia of pia mater, and gray substance; extravasation beneath scalp, at back part of head; bones of skull very hyperæmic in same situation; pneumonia patches in both lungs; usual condition of intestine. (*Ibid.*, p. 112.)

Another case was that of a little girl, aged eleven months, who sank into stupor and died, after only three days' vomiting and diarrhœa. The skull bones overlapped, and the nape muscles were contracted. On *autopsy* the straight and both lateral sinuses we found plugged up with a crumbling, adherent, symmetrically formed thrombus, while the brain, pia mater, and plexuses were hyperæmic and œdematous. No other lesion was revealed that would account for the head symptoms and the fatal issue. It is not improbable that the following case, which occurred in the writer's practice, belongs to the same category as the above:—

CASE LV.—The patient, a pale-looking little boy, aged about two and a half years, had dysenteric diarrhœa. The disease appeared to readily yield to the treatment employed, which consisted mainly in a carefully regulated diet, confinement to bed, poulticing the bowels, and administering calomel with Dover's powder in small doses, alternated occasionally with ol. ricini as a laxative. At the end of about the third day he was free from fever, his pulse and skin had become natural, his countenance bright though pale, his stools much less frequent, and more natural in appearance, and I expected he would make a speedy recovery. The next morning, however, I found him lying in a state of profound stupor, with dilated pupils, and a very pale face, I learned that the diarrhœa had given no trouble through the night, and that he was discovered to be insensible on trying to waken him in the morning. He sank rapidly, and died comatose, in the evening. No *autopsy*. His appearance was quite anæmic at the outset of his attack. It should also be stated that he had recently crossed the ocean from Europe with his parents, who were trades-people in moderate circumstances. This voyage, with the insufficient feeding for an infant likely

to attend it, may have had something to do in producing the anæmic state which was already present when the diarrhœa appeared. Now, although no autopsy was allowed in this case, I infer from the nature of his disease, from the morbid state of his blood, from the sudden appearance of stupor and coma, and from the post-mortem lesions which have been found in strictly analogous cases, that this little patient too had thrombosis of the sinuses of the dura mater which caused the coma and the fatal result.

With regard to the causation of the thrombi, and the interpretation of the clinical phenomena in cases such as the above, Dr. Gerhardt has offered a very reasonable, and upon the whole a very satisfactory theory, which is in substance as follows :—

The profuse discharge of fluids which not unfrequently attends the diarrhœa, as well as the cholera of infants, necessarily lessens the quantity of the blood, and produces inspissation of it. At the same time absorption of the parenchymatous fluid takes place throughout the substance of the organs in general, but especially in that of the very watery brain of infants. In consequence of this the contents of the skull become correspondingly diminished in volume, whereby the atmospheric pressure causes, first, depression of the fontanelles, and afterwards, when this no longer suffices, overlapping at the sutures. If this compensation also prove insufficient, a distension of the vessels of the brain and its meninges occurs; and the diminution of the general mass of the blood, the lowering of the power of the heart, and the inspissation of the blood itself, all tend to retard the current, that is, to produce stagnation, and lead to the formation of coagula in a locality so favourable as the sinuses of the dura mater. The unequal prominence of the jugular veins is a natural consequence of the obstruction of one of the lateral sinuses with coagulum, inasmuch as the vein corresponding to the obstructed sinus will be less full than the other. This phenomenon, which must be most strongly marked in the deep lying internal jugular vein, also shows itself by a circuitous route in the external jugular of the same side.

The observations of Dr. Gerhardt and others, render it pretty certain that in cases of cholera infantum and other diarrhœal diseases of children, where loss of consciousness, and other head symptoms suddenly and unexpectedly present themselves, the cerebral phenomena are due to the obstruction of the sinuses of the dura mater with coagula, much oftener than is generally supposed.

2. But thrombosis of the cerebral veins and sinuses of the dura mater not unfrequently occurs in children suffering from other diseases, especially those of a chronic and exhausting character. Thus, Prof Von Dusch relates the case of an infant, aged nine months, which came under his own observation.

The little patient was teething, and much debilitated by the discharge from a large abscess of the thigh. Death was preceded by great collapse, without convulsions. The superior longitudinal sinus was found completely filled anteriorly by a firm, three-cornered, pale clot of blood, that adhered to its walls, and was laminated in structure. The veins emptying into this sinus also contained tough, firm, colourless clots. Besides, the same writer has collected five other juvenile cases, in which the marasmic variety of cerebro-venous thrombosis appears to have been the immediate cause of death. One of them was a child, aged two years, "which had long been very weakly;" another was a little girl, aged four years, who had strumous ophthalmia, with swelling of the glands, and pneumonia; the third a boy, aged fourteen years, who suffered from ague-cachexia, with œdema of the limbs, enlargement of the liver and spleen, diar-

rhœa, etc.; the fourth a boy, aged fifteen years, who had for several months suffered from pleurisy, with œdema of the feet, and dyspnœa; and the last, a girl, aged twelve years, suffering from typhoid fever, one month advanced in its course.

Dr. West (*Lectures, etc.*, pp. 108, 109, 4th Am. ed.) relates a case in which the cerebral veins and sinuses of the dura mater were extensively obstructed with thrombi, and death appeared to have resulted therefrom.

CASE LVI.—The patient was a little girl, aged about thirteen months, who had sunk into a state of marasmus after an attack of scarlet fever. "No new symptoms came on till she was suddenly seized with extreme faintness, amounting to almost perfect syncope. She rallied, however, under the use of stimulants; but, forty-eight hours afterwards, the faintness returned, and terminated in death, without any convulsion having preceded it." On *autopsy*, the posterior half of the longitudinal sinus, the torcular, the left lateral, and left occipital sinuses were found blocked up with fibrinous coagulum, and their walls were thickened, etc. The ventricles contained a considerable quantity of fluid. There was great venous congestion beneath the middle lobe of the left hemisphere; the cerebral veins in that situation were distended with coagulum, and their coats were thickened. In the left middle lobe, towards its anterior part, were also four recent extravasations of blood, each of which was connected with an obstructed and distended vein. The largest clot extended an inch into the cerebral substance; the others were of smaller extent.

The cerebral hemorrhage constitutes an important feature of this case. It was obviously due to the occlusion of certain of the cerebral veins with thrombi. The blood brought into the brain by the arteries escaped into the cerebral substance, because it could not find its way out again through the obstructed veins. Moreover, this hemorrhage was, in all probability, the immediate cause of the faintness or syncope which terminated the patient's life.

Concerning the diagnosis of cerebro-venous thrombosis Dr. West justly observes that we are not acquainted with any symptoms which are pathognomonic of this affection; but when head-symptoms suddenly present themselves in debilitated or cachectic children and do not run the course of any ordinary form of cerebral disease, such symptoms will probably be found to be due to the formation of blood-clot in the cerebral veins or sinuses.

Dr. Bouchut, an eminent authority on the subject of thrombosis, relates (*Journ. f. Kindk.*, 1868) the two following cases, which serve to still further illustrate the clinical relations and phenomena of the marasmic variety of cerebro-venous thrombosis when it occurs in children:—

CASE LVII.—A little girl had suffered for several months from hooping-cough. Broncho-pneumonia ensued; incomplete anæsthesia attended, which quickly deepened into a condition resembling asphyxia. Then convulsions, lasting four hours, set in, were repeated twice on the same day, and led to death. The autopsy revealed considerable brain-congestion, and a small quantity of serous effusion in the pia mater under the arachnoid; besides, old coagula were found in the sinuses of the dura mater; these thrombi were hard and colourless, and one was fifteen centimetres in length; it extended along the lateral sinus, and reached the mouth of the jugular vein. Another thrombus, still harder and paler, lay in the superior longitudinal sinus. It had grown fast to the walls and completely obliterated the sinus.

CASE LVIII.—Another case was that of a phthisical child, in whom thrombosis of the cerebral sinuses induced delirium twelve hours before death. The ophthalmoscope revealed a gray papilla, surrounded apparently by œdema. The boundaries were not recognizable, and were rather surmised from the puncta around which the veins radiated. The vessels were large and pale; the choroid also was very pale, and, like the retina, looked as if covered with fine white sand. The cause of the delirium was sought for in the sinuses of the dura mater, and the associated atrophy. The accuracy of this diagnosis was confirmed by autopsy. Tubercles and cavities were found in the lungs. The longitudinal and transverse sinuses of the dura mater were completely closed by blood-plugs, of which some were old, whitish, firm, and more or less adherent to the walls, whilst others were still fresh, blackish, soft, and had clearly been formed in the last moments of life. The brain and its membranes were sound. On examining the eyes there was seen, through the retina, close around the papilla, a rosy areola beset with red puncta. After removing the retina it was easily seen that the vessels of the choroid were filled with blood. The inner layer of this membrane had quite vanished, a few cells only were seen, and these had degenerated into fat. The pigment-cells of the lamina were quite gone, or were atrophic. The sand-like appearance seen with the ophthalmoscope before death was only an optical illusion, and was plainly due to the want of pigment in the choroid. (*New Sydenham Soc. Retrospect*, 1867-1868, pp. 426, 427.)

The latest clinical observations of Bouchut teach that, in cases where, after long chronic diseases, children die in convulsions or delirium, we should look for thrombi in the great veins of the brain and its membranes. He also recalls to mind how many chronic diseases of children terminate in convulsions. As a rule, they are the forerunners of death. Many children thus die in the course of marasmus brought on by lung-phthisis, simple, chronic, and tubercular enteritis, vertebral caries, white swelling of the joints, whooping-cough complicated with broncho-pneumonia, etc. It was long believed that the delirium and convulsions which appear at the end of such chronic diseases were simply the result of impoverishment of the blood. Most physicians think that inanition and chlorosis are the consequences of the cachectic state, and that the cachexia itself is developed through the protracted disease of the infant organism. This is generally true, and Bouchut recognizes the correctness of Marshall Hall's explanation of hydrocephaloid.

But there are cases, he says, such, for example, as the above, in which the loss of consciousness and convulsions result from a quite different cause. In them the formation of thrombi in the sinuses of the dura mater, which obstruct the flow of blood from the brain, produces passive congestion of the brain-substance, and impaired nutrition of the nerve-fibres and ganglion-cells. For when the venous blood does not flow out of the cerebral capillaries the fresh arterial blood which is necessary to the performance of the function of nutrition cannot pass into the cerebral capillaries so as to reach the histological elements of the cerebral substance and maintain their functional activity and integrity. Whenever this form of passive congestion of the cerebrum is excessive and not compensated for, the ganglion-cells and nerve-filaments of the cerebrum lose their functional activity, and loss of consciousness ensues; and the loss of consciousness may be partial or complete; it may be stupor on the one hand, or coma on the other, according to the degree of the passive con-

gestion, or the completeness with which the escape of venous blood from the brain-substance is prevented by the presence of coagula in the cerebral veins and sinuses of the dura mater. Finally, in some cases where at first the passive congestion of the brain-substance is not severe enough to produce stupor or convulsions, it may so modify the nutrition of the brain-substance as to induce delirium.

Dr. M. E. Fritz (*Bulletins de la Société Anatomique de Paris*, 1860, pp. 70-73) relates a very instructive case of marasmic thrombosis of the cerebral veins and sinuses of the dura mater, of which the following is an abstract:—

CASE LIX.—A boy, aged 11, an inmate of the Hôpital des Enfants, had Pott's disease of spine, with profuse purulent discharge, and was becoming much debilitated, when he was suddenly seized, August 28th, with vomiting, headache, and drowsiness. On August 29th he was found in bed lying on his back, with shrunken features, moaning, and unconscious; eyes convulsed, axes divergent, pupils dilated; lower extremities contracted; pulses slow and irregular.

August 31. Profound coma; afterwards profuse sweats limited to face, neck, and upper part of chest.

September 4. He had convulsions in the morning, and died comatose at 8 in the evening.

Autopsy.—Brain very soft, almost diffuent; arachnoid raised up by a serous fluid, containing some gelatinous flocculi. Four or five cerebral veins (superior and anterior, on both sides) were distended and plugged up to the extent of several centimetres, next to the sinus, with blackish-brown, tolerably dry, and elastic coagula; cerebral veins generally much gorged with blood. The vein-clots were continuous with a thrombus which occupied the superior longitudinal sinus through its whole length. In anterior half of sinus the thrombus was dark-brown; back of that, grayish-white, spotted with red externally, and of the colour of wine-lees at the centre, adhering pretty closely by its outer layers to the fibrous bands of the sinus; still further back it became thin, no longer filling up the calibre of the sinus, and its extremity was prolonged a little into the torcular Herophili. The walls of the sinus nowhere presented an inflamed appearance, being smooth and not injected. The left lateral sinus also contained a small coagulum, similar to the above.

The light-coloured part of the thrombus, under the microscope, was found to consist of granular fibrin, mingled with a great number of leucocytes, some oil-drops, and red globules more or less altered. These facts showed that the coagulation was not very recent.

Dr. M. E. Fritz (*Ibid.*, pp. 75-77) relates another very interesting case of infantile marasmic thrombosis of the cerebral veins and sinuses of the dura mater. The following is a condensed account of it:—

CASE LX.—A little boy, aged $3\frac{1}{2}$ years, entered the Hôpital des Enfants January 5, 1859, for prolapsus of rectum of six months' standing. Badly nourished and living in misery he had had measles and smallpox in the last six weeks; and a few days before admission he was seized with whooping-cough. He was very pale and feeble, but without fever; the fits of coughing were pretty frequent, and terminated by vomiting. January 7. Symptoms of capillary bronchitis. January 8th and 9th. He was extremely prostrated and unable to sit up; face extremely pale. On the evening of the 9th he became delirious. On the morning of the 10th he was much sunken, and did not reply to any question. His general sensibility was blunted, but not extinguished; breathing difficult and oppressed. During the day strabismus appeared. In the evening pulse 180 and very small. He died on the 11th.

Autopsy.—Visceral arachnoid considerably elevated by serum. Cerebral veins gorged with black blood; superior longitudinal sinus contained, besides some liquid blood and soft black coagula, a fibrinous concretion which extended

its whole length. It adhered to the walls, which were entirely normal, by some prolongations that entwined themselves in the trabeculæ of the angles. It nowhere completely obliterated the calibre of the sinus. At the posterior extremity it was cylindrical and had a diameter of four millimetres; at the middle it was ribbon-shaped or flattened; at the anterior extremity it terminated in a point. It sent prolongations into many veins along the sinus. The calibre of these veins was thus almost completely obliterated. The right lateral sinus was occupied by a similar concretion, nine centimetres long by about four millimetres thick. The middle lobe of right lung presented numerous spots of atelectasis, accompanied by capillary bronchitis with thick purulent secretion.

These two cases differ from each other very much in respect to the symptoms referable to cerebro-venous thrombosis which presented themselves during life. In the first of them the attack came on suddenly with vomiting, headache, and drowsiness. There followed convulsive movements of the eyes, with dilated pupils and divergent strabismus, profound coma, general convulsions, and death. In the other, the earliest head-symptom was delirium. Towards the end, however, strabismus appeared, but there were no general convulsions. These cases also differ from each other equally much in respect to the coagula which were found in the cerebral veins and sinuses of the dura mater, on autopsy; for in the first case the thrombus was large enough to fill up the calibre or completely obstruct certain of these vessels, while in the other the thrombus was not large enough to entirely occlude any of these canals. Dr. Fritz's cases, therefore, strongly support the views of Bouchut, expressed above.

These thrombi also differed from each other a good deal in other particulars besides their size, which will readily suggest themselves to the reader, and thus render it unnecessary to spend much time in their discussion in this place. One point, however, requires special mention, namely, in the first of these cases the great thrombus which occupied the superior longitudinal sinus was unmistakably formed at two distinct epochs. In the anterior half of this sinus it was dark-brown in colour, and resembled a recent blood-clot in appearance. In the posterior half it was grayish-white in hue, and much older in appearance, having existed long enough to become decolourized, as was shown by the broken-down and disintegrated condition of the red corpuscles belonging thereto, which was revealed by the microscopical examination. Besides, it is worthy of remark, that the walls of the thrombosed vessels did not show any signs of inflammatory action in either case.

Dr. Crisp (*Transact. Patholog. Soc. of London*, vol. x. pp. 117, 118) has related the following remarkable instance of what appears to be idiopathic thrombosis of the cerebral veins and sinuses of the dura mater:—

CASE LXI.—The patient was a girl, aged 16, who died after about fourteen days' illness. The symptoms were headache, confusion of intellect, and vomiting, followed by hemiplegia of right side, loss of speech and of power to protrude the tongue, and inability to pass water. Death was preceded by coma. No cause for her attack could be assigned.

Autopsy.—The superior longitudinal sinus was filled with coagulated blood,

interspersed with portions of fibrin closely adhering to the walls thereof, The superior cerebral and cerebellar veins were also extensively thrombosed. The superficial cerebellar veins were nearly all plugged with fibrinous coagula, and all the cerebral veins entering the superior longitudinal sinus were firm and cord-like from the same cause. The upper and lateral portions of the arachnoid were opaque on both sides. The pia mater was rather vascular. The lateral ventricles contained about two teaspoonfuls of reddish serum, and about the same quantity was found under the arachnoid at the upper part of the spinal cord.

The autopsy does not appear to have revealed any cause to which the death of this young girl could be ascribed, other than spontaneous coagulation of the blood in the veins and sinuses belonging to her brain. How does cerebro-venous thrombosis arise in such cases? First of all, the blood itself must be in a condition to readily coagulate, that is, the blood must be more coagulable than natural, or in a morbid state whereby its coagulability is greatly increased. Besides, a protracted stasis of the blood in these vessels, such as might readily attend a passive congestion of the brain, and perhaps also an expanded condition of the cerebral veins and sinuses, such as might be induced by a vaso-motor paralysis of these vessels, would, if present, determine the occurrence of the coagulation. It is not impossible that all these causes combined to produce the thrombosis in the above case.

Dr. Andrew (*Transact. Patholog. Soc. of London*, vol. xvi. pp. 27, 28) has reported an exceedingly interesting case of cerebro-venous thrombosis, which in many particulars resembles the one last related. It illustrates in a striking manner the clinical history and post-mortem appearances of the marasmic variety of this disorder when it occurs in anæmic young women.

CASE LXII.—Eliza S., aged 20, admitted to St. Bartholomew's Hospital March 29, 1865; had enjoyed good health up to twelve months before, when, without apparent cause, her catamenia suddenly ceased, and she began to suffer from anæmia. On admission she was very feeble and anæmic; ankles œdematous; pain in left side; anæmic murmurs in neck, etc. She complained of slight headache, at first frontal, which gradually became more intense, so that on the night of April 3d it kept her awake. On April 4th she vomited several times, and was delirious during the night. On the 5th she gradually became insensible and comatose; pulse 90–120, and slightly irregular. On the 6th, at 10½ A. M., she died.

Autopsy.—Cerebral convolutions flattened, particularly on right side, and marked by impress of the fibres of dura mater. A dark clot, the size of a pea, in posterior part of each hemisphere about half an inch from upper surface. Considerable blood-stained fluid in each lateral ventricle, also a long thin dark clot in right one, lying upon the corpus striatum and optic thalamus. Septum lucidum entire, but soft. Optic thalami unusually prominent; on section, they are found to be œdematous, and studded with numerous small dark clots, by which their substance is broken down, but these changes are more marked in the right than in the left one. The veins of the choroid plexus and velum interpositum, also the venæ Galeni, are distended with firm, partly yellow, fibrinous coagulum. It extends continuously along the straight sinus, and about an inch into the lateral sinuses, but rather further down the right than the left one. It does not completely fill up the calibre of the lateral sinuses, whilst the straight sinus and the tributary veins are greatly distended thereby. The oldest part of the thrombus was found at the junction of the

straight with the lateral sinuses. Here it was of a dull pinkish tint, and somewhat soft. In the other sinuses the blood was almost entirely fluid. Cerebral arteries not diseased. Cerebral substance throughout rather soft and watery. No tubercle in any organ. In each lung several branches of the pulmonary artery were obstructed by old clots, some of which were breaking down at the centre. Beneath endocardium of left ventricle (which was firmly contracted) were numerous large ecchymoses.

The symptoms referable to thrombosis of the cerebral veins and sinuses of the dura mater, which this patient exhibited, were headache, gradually increasing in severity, vomiting, delirium, stupor, coma, and death. Moreover, this disorder appears to have run its whole course in three or four days.

The autopsy revealed cerebral hemorrhage, cerebral œdema, ventricular effusion, and obstruction of the veins of Galen, velum interpositum, and choroid plexus, as well as the straight and lateral sinuses with fibrinous coagulum. But the oldest part of the thrombus was found at the junction of these sinuses. This circumstance shows that the coagulation began in a portion of the cerebral sinuses where the calibre is widely expanded, where the blood-stream is usually sluggish, and where the blood itself would be likely to stagnate on lessening much the power of the heart and arteries to carry on the circulation. The extravasations of blood, which, by the way, were very numerous, the œdema of the cerebral substance, and the effusion into the ventricles, were clearly due to the blocking up of the straight sinus and the tributary veins with thrombus.

It is also worthy of special mention that this young woman was very pale, feeble, and anæmic; that her ankles were œdematous; and that she had anæmic murmurs in the neck ere she was attacked with cerebro-venous thrombosis. In other words, the occurrence of this disorder was preceded by undoubted evidence of blood-disease. In all probability this blood-disease was the principal cause of the thrombosis; for the anæmia or chlorosis doubtless was attended with much diminution in the quantity of red corpuscles and much increase in the white ones, and from this change in the composition of the blood there resulted a considerable increase in its coagulability.

Again, anæmia and debility the result of *excessive bloodletting* sometimes lead to coagulation of the blood in the cerebral veins and sinuses of the dura mater, especially in persons who are predisposed to this disorder. It is scarcely necessary to say that these cases are very important in a practical point of view. Von Dusch presents two rather striking instances, of which the following is a brief account:—

A lying-in woman, aged 23, was attacked by peritonitis twice during the first week after delivery, for the cure of which copious local bleeding was repeatedly employed during nine days. Twice, forty leeches were applied, and, on two other occasions, twenty, making in all one hundred and twenty leeches. A fortnight after delivery headache and vomiting appeared, followed by hemiplegia. Great restlessness and screaming supervened, then coma, and finally, death three weeks after delivery. It must be added that, in consequence of the new symp-

toms, she was bled once in the arm, and had fifteen more leeches applied on various occasions.

Autopsy.—The superior longitudinal sinus was seen to be very much distended, and of a glittering blackish appearance. It was filled up by a thrombus, in the centre of which there was a puriform fluid, resembling wine-lees. The right lateral sinus also was blocked up, in the direction of the jugular vein, by a firm coagulum which contained a similar fluid. The other sinuses were quite normal. There were ecchymoses in the gray matter on the surface of the brain, especially in the course of the thrombosed veins on the convex surface and at the base. In the true pelvis two collections of pus were found, and, in the veins of the uterus, corresponding to the place where the placenta was attached, very firm, small, black plugs. In the chest there was nothing abnormal (*op. cit.*, 108).

In this case thrombosis of the cerebral veins was the cause of death. It occurred because the coagulability of the blood was greatly increased on the one hand, and the heart-power was greatly diminished on the other. The abnormal coagulability of the blood, however, was due in part to the puerperal condition of the patient, and in part to the excessive losses of blood by leeches and venesection to which she was subjected, for it is well known that the puerperal state is usually attended with a considerable increase in the coagulability of the blood as a consequence of hyperinosis, and that copious bloodletting generally causes a great increase in the coagulability of the same fluid. But excessive bloodletting also weakens the action of the heart, and thus assists more or less strongly in producing cerebro-venous thrombosis in such cases as the foregoing.

The other case claims affinity to the last in one important respect, namely, in it the formation of thrombus in the sinuses of the dura mater was also due, to great extent, to colossal bloodletting.

A soldier received a gunshot wound of the left parietal bone, which produced fracture with depression. The symptoms which supervened rendered trephining necessary. The patient was also bled five times in a short period. Death occurred on the thirteenth day.

Autopsy.—Fleshy coagula were found in the left lateral sinus, and smaller ones of similar appearance in the superior longitudinal and right lateral sinus. There were also fracture of the inner plate and purulent arachnitis (*op. cit.*, pp. 109, 110).

If in this case the formation of the thrombus had been induced by the arachnitis, one or more of the contiguous veins of the pia mater would pretty certainly have been found thrombosed, and, in all probability, the thrombus itself would have been discovered to be broken down, and undergoing puriform softening, as usually obtains in venous thrombosis connected with suppurating parts. It is therefore highly probable that the arachnitis had but little, if anything, to do with the production of the thrombosis. However, the injury itself, and the operation of trephining, doubtless were concerned in producing it; but this circumstance should not lead us to overlook the influence which five venesections, all performed within a short period, must exert in the way of increasing the coagulability of the blood, thereby promoting the occurrence of venous thrombosis in the neighbourhood of the injured part; besides, these venesections must

have weakened the heart-power considerably. We must therefore look upon excessive loss of blood by venesection as an important, if not the chief, cause of the thrombosis of the cerebral sinuses which occurred in this case, and its importance, in a practical point of view, is not diminished by the fact that it was entirely preventable.

The *syphilitic cachexia*, and syphilitic diseases of the brain or its membranes, are sometimes attended by the formation of coagula in the cerebral veins and sinuses of the dura mater, whereby these vessels become more or less completely obliterated. Von Dusch does not mention this form of cerebro-venous thrombosis. It is, therefore, incumbent upon us to give particular attention to this point. Dr. Murchison (*Transact. Patholog. Soc. of London*, vol. xiii. pp. 250-253) has reported two cases, one of which certainly, and the other probably, comes under this head. The following is a much condensed account of them :—

CASE LXIII.—The subject was a woman, aged 27, who died of syphilitic cachexia, at the Middlesex Hospital. After complaining of vertigo, dimness of sight, and headache for a time, she got epileptic fits, but her consciousness remained clear almost to the last. On *autopsy* there were found extensive syphilitic deposits on the dura mater, moderate injection of the pia mater, numerous puncta vasculosa, and thrombosis of the sinuses of the dura mater, in addition to other lesions. The sinuses were full of dark soft coagulum.

The writer infers from the symptoms which presented themselves during life, and from the appearances which the thrombus exhibited at the autopsy, that it was formed during the closing hours of life. Nevertheless, it may have played an important part in producing the fatal result.

CASE LXIV.—The other patient was also a woman, aged 36, who, after having had repeated attacks of copper-coloured eruptions, periostic nodes on cranium, intense pain in forehead and occiput aggravated at night, was attacked with “fits” and died a fortnight later at the Middlesex Hospital. The “fits” commenced with a scream, and were attended with loss of consciousness, but not by foaming at the mouth, nor by convulsive movements. The “fits” increased in frequency and severity until she died, while, in the intervals, she had intense pain in the forehead and occiput.

Autopsy.—Pericranium thickened in spots. Bones of skull generally thicker and denser than natural, etc. While removing the brain the left hemisphere of the cerebellum was found so firmly adherent to the dura mater, that a portion was torn off and left behind. The dura mater in rear of the petrous portion of temporal bone, and on the occipital as far as the mesial line, was greatly thickened by the deposit on its inner surface of flattened masses of a firm yellowish-white substance, exhibiting a smooth surface on section, and yielding no juice. This deposit extended at some places fully half an inch under the tentorium at its attached margin. The left lateral sinus passed through the diseased mass, and its canal was quite obliterated. There was an evident connection by continuity between the disease of the dura mater and the periostic nodes external to the bone.

It seems highly probable to the writer that in this woman's case the obliteration of the left lateral sinus was effected through the agency of a thrombus, and that the formation of the thrombus itself was due in part to syphilitic pachymeningitis and in part to syphilitic cachexia.

Analogous in some respects to the last group are those cases wherein a *fungous tumour of the dura mater* causes the blood to coagulate in one or more of the cerebral sinuses.

Mr. Forster (*Transact. Patholog. Soc. of London*, vol. ii. pp. 162, 163) has recorded the following case in which thrombosis of the right lateral sinus resulted from the above-mentioned affection of the dura mater :—

CASE LXV.—A strumous lad, aged 18, was knocked down by a cab, and struck on the right side of his head nineteen months before death. Soon afterwards he became deaf and suffered severe pain. The part became slightly swollen and excessively tender, especially over the mastoid process; paralysis of the right facial nerve also took place. No great change occurred until the last six months, when from another blow on the same spot, the disease grew more active. The side of his head from above the temporal ridge to two inches below the ear, became enormously enlarged and tender; the external ear appeared to be pushed away from the side of his head. He experienced great difficulty in swallowing solid food, and was also unable to speak. About two months before death the swelling began to fungate and slough. Profuse hemorrhage occurred at intervals. The sloughing extended very rapidly, and at last laid the pharynx bare. No brain symptoms appeared. The hemorrhage and the suppuration, which also was profuse, quickly destroyed him.

Autopsy.—The tumour which caused the swelling was developed from the dura mater. The temporal bone was carious and extensively destroyed in consequence of the pressure exerted by the tumour. No vestige of meatus or mastoid cells could be found. The lateral sinus was filled with a coagulum.

No head-symptoms resulted from the thrombosis in this case because it was limited to one lateral sinus, and, therefore, the blood could for the most part, readily find its way out of the brain through the other lateral sinus, etc.

In cases such as this it has been customary to ascribe the formation of thrombus to compression of the affected sinus resulting from the growth of the tumour. Von Dusch (*op. cit.*, p. 103) quotes a case from Virchow, in which there was a large cholesteatoma in the left petrous bone, and at the same time thrombosis of the left lateral sinus, etc.; but the patient had also had otorrhœa for twelve months, and when we consider the intimate relationship which has in another place been shown to exist between disease of the internal ear and thrombosis of the corresponding lateral sinus, we are led to refer the causation of the thrombosis in Virchow's case to the ear-disease quite as much as to the tumour. Indeed, Von Dusch perceived this point, for he remarks that although the formation of thrombus in the cerebral sinuses as a consequence of compression, etc., seems *a priori* very probable, "the few cases to be met with in the literature of the subject for the most part indicate other sources." So too in the case related above, the writer thinks that the formation of the thrombus should be attributed to the marasmic state of the patient which resulted from the hemorrhages and the suppuration, rather than to any diminution in the calibre of the sinus which may have been produced by the fungous growth.

Anæmia and debility, the result of *chronic disease of the rectum*, sometimes proves fatal by inducing cerebro-venous thrombosis. Dr. Ogle (*Transact. Patholog. Soc. of London*, vol. vi. pp. 31, 32) has reported a case of this sort, in which several cerebral veins and sinuses of the dura mater were occluded by dense fibrinous clots that were traceable to a spon-

taneous tendency in the blood to the deposition of fibrin. The following is a brief abstract thereof:—

CASE LXVI.—The patient was a woman, who gradually sank in St. George's Hospital, whither she had been brought for long-continued disease of the rectum. The symptoms exhibited towards the close of life were those of asthenia, and nothing pointed to disease of the brain, excepting that a short period before death, she completely lost the faculty of speech, the mind being unaffected.

The *autopsy* showed the presence of much blood-stained fibrin which blocked up the left lateral sinus, the inferior longitudinal sinus to a certain extent, the straight sinus, most of the venæ Galeni, the left petrosal sinus, and several veins which pass into the above-mentioned sinuses from the sides and base of the cerebral and cerebellar hemispheres. The coagulum did not extend beyond the posterior jugular foramen. The subarachnoid tissue and the ventricles contained much fluid, but the substance of the brain and its membranes were natural. No marked lesion of any organ excepting the rectum was found, and no collection of purulent matter existed in the body.

Other exceedingly chronic diseases may in adults, as well as in children, as we have elsewhere shown, so far as the latter are concerned, bring about a state of marasmus with increased coagulability of the blood and the formation of thrombi in the cerebral veins and sinuses of the dura mater. Von Dusch (*op. cit.*, pp. 107, 108) presents a case in point, wherein a man, aged 53, who had old hepatic and renal disease, with cough and copious expectoration, ascites, anorexia, and loss of strength, got diarrhœa with involuntary evacuations, accessions of unconsciousness, and thus died. On *autopsy* there were found cirrhosis of the liver, degeneration of the kidneys with cysts and concretions, thrombosis of the superior longitudinal sinus and of some of the corresponding veins of the pia mater, etc. The lungs were œdematous, and the pulmonary arteries contained obstructive plugs. Again we remark that any chronic disease which produces a cachectic state, and increases the coagulability of the blood as well as weakens the action of the heart and arteries, may in like manner lead to cerebro-venous thrombosis in adults as well as in children.

But diseases which run a comparatively short course—diseases which are by no means chronic—such for example as pneumonia, pleurisy, typhoid fever, etc., may also cause the blood to become abnormally coagulable and clots to form in the cerebral veins and sinuses of the dura mater in both adults and children. The following case reported by Dr. Ogle (*Transact. Patholog. Soc. of London*, vol. x. pp. 30, 31) comes under this head:—

CASE LXVII.—A man, aged 26, entered St. George's Hospital for pneumonia of left side (a relapse?). His pulse was very feeble and debility great. Afterwards he complained of intense pain in the head, especially in the back part thereof, and subsequently in the left temple. He was treated with wine and other stimulants. About five weeks after admission, he was found one morning in bed totally unconscious, and deprived of all power of moving the left arm and the left leg. He lay three days in a state of half-stupor and then died.

Autopsy.—The superior longitudinal, left lateral, and left petrosal sinuses were found plugged up by firm, and for the most part reddish-brown coagulum, which generally adhered pretty firmly to their walls; but in one or two places

was diffuent and broken down into a grayish-brown grumous fluid. Several veins of the pia mater, both small and large, which empty into the sinuses, contained brown adherent clots, but none of them were softened. The veins on the right cerebral hemisphere were very much engorged. The left arachnoid sac contained a considerable amount of yellowish purulent fluid mixed with soft fibrinous material. Brain-substance slightly softened at the postero-inferior part of middle lobe of left cerebral hemisphere. An abscess about the size of a hazel-nut, existed about one-third of an inch from the surface at this spot. A large amount of turbid fluid in the lateral ventricles. The lungs showed evidences of recent pneumonia. In one or two places the pulmonary tissue had given way, accumulations of purulent matter having formed.

Von Dusch mentions an analogous case:—

The patient was a servant girl, aged 20, who was attacked with pleuro-pneumonia while suffering from typhoid fever. Contraction of the cervical muscles, convulsions of right side, and coma supervened; death ensued. The cerebral veins, superior longitudinal and lateral sinuses were found extensively obstructed with firm adherent coagula.

In both of these cases the cerebro-venous thrombosis which was developed after the occurrence of pneumonia may fairly be regarded as a result of marasmus, unless we consider the cerebral affection to be metastatic, an assumption, however, which appears much more forced.

The case of a young girl, aged 12 (already referred to), who died of a cerebro-venous thrombosis which came on at an advanced stage of typhoid fever, belongs to the same category as the above. In this case clonic and tonic convulsions, with loss of consciousness, but not of sensibility, suddenly supervened. These phenomena lasted an hour. A fresh accession soon occurred, with trembling of the muscles which lasted till death. The convulsions were followed by coma and contracted pupils. On *autopsy* the whole of the superior longitudinal sinus was found obstructed by a coagulum, everywhere adherent and partially decolourized, as also the veins of the pia mater communicating with it, etc.

Again, thrombosis of the cerebral veins may occur in connection with thrombosis of the veins of the extremities and pyæmia, as it did in the case which Dr. Janeway brought before the New York Pathological Society, April 8, 1868 (*Medical Record*, July 15, 1868).

CASE LXVIII.—The patient was a news-boy, aged 16, who entered Bellevue Hospital on the morning of April 4th, giving an imperfect history to the effect that three days before he observed on waking in the morning an "injury" to his right forearm, near the wrist, and saw a physician that day who applied splints. On entering the hospital these were removed and evaporating lotions applied. At that time he exhibited no cerebral symptoms, but in the evening he was slightly delirious, though he still walked about the ward. The next morning his condition was about the same; towards night, however, he became comatose, and so remained until death occurred at 10 P. M. the following day, April 6th. While in this state his pulse was 120 to 130, and respiration about 40.

Autopsy.—Forearm and hand cedematous. A fluctuating tumour at the wrist contained a quantity of sanious pus, that had burrowed among the tendons down to the bone; periosteum thickened and vascular, but not detached. The outer one of the radial venæ comites contained, in the middle of its course, a firm clot about two inches in length; the inner one, a whitish clot of soft consistence from commencing disintegration. The basilic and axillary veins, with the

brachial venæ comites, were distended throughout their course with soft coagulum. On the brain, chiefly on its convexity, many small opaque spots were seen in the arachnoid and pia mater, the result of thickening. Each of them was surrounded by a red border, due sometimes to congestion, sometimes to extravasation. The brain-substance showed several points of hemorrhage. *Three of its larger veins contained attached fibrinous clots*, evidently formed some time before death. In the lungs were hemorrhagic infarctions and so-called metastatic pneumonia and pleurisy. In the left ventricle were many fresh signs of ulcerative endocarditis. Numerous small white points surrounded by red areolæ, similar to those found on the arachnoid, were also found on the exterior of the heart, on the liver, in the kidneys, and small intestines. Prostate, bladder, etc., normal.

This boy's illness was of less than six days' duration. It ended fatally by coma, that is, death began at the brain. The case itself is an unusual one, and possesses three features of intense interest and great importance. They are, *firstly*, the abscess at the wrist with the accompanying thrombosis of the veins of the forearm, etc., and the pyæmic lesions of the lungs; *secondly*, the ulcerations and other changes in the left ventricle of the heart, and the multitude of white points surrounded by inflamed areolæ which were found on the surface of the brain, liver, kidneys, small intestines, and heart itself, that probably had been produced by the lodgment in the capillary arteries of these parts of minute emboli that had been washed out of the left ventricle by the blood-stream; and, *thirdly*, the obstruction of several cerebral veins of large size, with thrombus, and the occurrence of coma and death in consequence of this obstruction. It is probable that the patient would have lasted some time longer if thrombosis of the cerebral veins had not taken place. Moreover, the plugging up of these vessels was attended with the extravasation of blood at several points in the brain-substance. This case, then, serves an admirable purpose for illustrating thrombosis of the cerebral veins, thrombosis of the veins of the extremities, and capillary embolism, the result of ulcerative endocarditis.

Lastly, we have to point out that thrombosis of the cerebral veins and sinuses is an occasional consequence of *senile marasmus*. Cruveilhier (*Anat. Patholog. du Corps Humain*, liv. 36, pp. 2, 4, 5) relates two cases of this sort. One of them was that of an old woman of weak intellect, who died after twenty-four hours' coma. The superior longitudinal sinus and the veins communicating therewith were filled with a brilliant, black, adherent thrombus, and the gray substance of the cerebral hemispheres contained numerous capillary hemorrhages, etc. The other case was that of a woman, aged 80, who after having paralysis of the left half of the body, excepting the tongue and face, for some time, got paralysis of the right side, and thus died. The superior longitudinal and lateral sinuses were blocked up by thrombus, and the superior cerebral veins were also filled with plugs. In the arachnoid sac a fresh extravasation of blood was spread out over the convex surface of both hemispheres, etc.

A case related by Dr. Charcot (*Bouchard on the Pathology of Cerebral Hemorrhage*, pp. 16, 17, London, 1872) is in point. In it, however, the cerebro-venous thrombosis was due in part to senile marasmus, and in part to the depressing influence of disease.

CASE LXIX.—A female, aged 65, had pneumonia in 1858, and again in 1863. In the summer of 1865 she was under treatment for cirrhosis and ascites. On August 21st, she suddenly became paralyzed on the right side. On the 23d, at 2 A. M., she became comatose; at time of visit her breathing was stertorous, pulse small and frequent, skin warm. The limbs were all flaccid; reflex movements on both sides abolished. At 4 P. M. she died.

Autopsy.—Extensive subarachnoid hemorrhage on both cerebral hemispheres, more abundant, however, on the right than on the left one. Dark-coloured very friable clots filled up each lateral ventricle. The floor of the left one was the seat of yellow softening throughout. The left optic thalamus presented a reddish pulp on its surface, consisting of blood mixed with softened cerebral tissue. A patch of red softening was also found on the left hemisphere behind the convolution which bounds the fissure of Rolando. The gray matter had the colour of wine-lees, and the white substance beneath was softened and slightly yellowish. Another patch of red softening was found on the right hemisphere behind the fissure of Rolando, but it was smaller than the preceding. The arteries of the base were not atheromatous. On the surface of the clots which covered the inner aspect of both cerebral hemispheres two veins that emptied into the superior longitudinal sinus were seen to be stretched; they were yellowish in colour, and *contained old clots*. Liver cirrhotic; peritoneal cavity distended with yellowish serum.

The cerebral hemorrhage and cerebral softening were doubtless occasioned by thrombosis of the cerebral veins. It is also worthy of remark that cerebral or meningo-cerebral hemorrhage occurred in both of the other cases of senile thrombosis of the cerebral veins and sinuses of the dura mater mentioned above. From this circumstance we infer that when cerebro-venous thrombosis occurs in old persons, it is especially prone to occasion cerebral hemorrhage, and this relationship may be accounted for by the fact that the walls of the bloodvessels in general, usually become weakened by atheroma, fatty degeneration, etc., with advancing age.

But, in the last case, the longitudinal and other sinuses of the dura mater did not contain any coagula; and thus it is conclusively shown that thrombosis of the cerebral veins, attended with very striking morbid changes and consequences, may occur without there being any thrombosis of the corresponding sinuses of the dura mater. In Dr. Janeway's case LXVIII, also, certain of the cerebral veins were obstructed with thrombus while the sinuses remained free, and still cerebral hemorrhage was present. The reader's attention is specially called to this point, because it is a new one, and possesses considerable interest, at least for pathologists.

Etiology.—The clinical histories related above, and in the preceding paper, show pretty clearly that in one set of cases the blood coagulates in the sinuses of the dura mater as an immediate consequence of cranial injury, especially when the sinus-walls themselves are implicated, that in another set of cases the blood coagulates in these vessels as a result of various inflammatory affections of the head, internal ear, eye-socket, nose-cavity, and

face, and that in still another set of cases the cerebro-venous thrombosis is occasioned by wasting diseases or debilitating influences. Thus, we find that this disorder presents three important varieties, in respect to causation, namely, the *traumatic*, the *inflammatory*, and the *marasmic*. Some of them, however, occur much less frequently than others. For example, in looking over the 58 cases presented by Von Dusch, I find but 2 in which the origin was directly traumatic, while in 34 the causation was inflammatory, and in 22 marasmic. Besides, out of 72 additional cases collected by myself the thrombosis had a traumatic origin in only 4 instances, an inflammatory starting point in 52, and a marasmic origin in 16 patients. Finally, in a grand total of 130 cases, thus obtained, we have but 6 in which the coagulation resulted directly from traumatic causes, 86 from inflammatory lesions, and 38 from marasmic conditions, or debilitating influences. From this it appears that the inflammatory is by far the most common form of cerebro-venous thrombosis, inasmuch as it has been met with considerably more than twice as often as the marasmic, and rather more than fourteen times as often as the traumatic. Dr. Lancereaux, however, states that of 74 cases collected by himself 39 were inflammatory and 35 non-inflammatory in respect to origin; but he has doubtless overlooked many of the inflammatory cases which have rewarded my researches, and therefore his statement does not disprove the conclusion arrived at above.

1. *Causes of the Traumatic Variety.*—Concerning the formation of the coagula which are occasionally met with in the sinuses of the dura mater after injuries of the skull, Virchow has already pointed out that in some cases the coagulation probably begins in the wounded veins of the diploë as a consequence of the atmospheric air coming into contact with the blood at the gaping orifices in these vessels; for the nature of the veins of the diploë is such, and their walls are so firmly attached to the surrounding bone, that they cannot collapse, and, therefore, in cases of compound fracture of the cranium, with depression, gaping apertures may readily present themselves in the veins of the diploë through which a hemorrhagic thrombus formed externally to them may easily extend into their calibre, and thence by further prolongation may penetrate the corresponding sinus of the dura mater. In other cases, however, the formation of coagulum in the sinus is due to the fact that some foreign body, such, for example, as a fragment of the inner table of the skull, has been driven into the calibre of the sinus, and that the blood, on coming into contact with this foreign body, coagulates around it, as crystals form around foreign bodies when suspended in crystallizable liquids. This is precisely what happened in a case quoted from Schmucker by Von Dusch, wherein a splinter from the vitreous plate half an inch long penetrated the superior longitudinal sinus, and that vessel soon became plugged up with a firm

thrombus, which afterwards, to a considerable extent, underwent puriform disintegration or softening.

But thrombosis of the cerebral sinuses does not occur in all the cases wherein the part of the cranium which overlies the vessels in question is fractured in such a manner as to expose the lacerated veins of the diploë to atmospheric action, nor in all the cases wherein a foreign body is driven into the calibre of a sinus, nor in all the cases wherein the walls of a sinus happen to be wounded. On the contrary, it occurs in only a small portion of these cases, as is clearly shown by the records of clinical experience, such, for example, as M. Lassus's *Memoir on Wounds of the Superior Longitudinal Sinus* (already referred to), various of the treatises on cranial fracture, the current annals of clinical surgery, etc.

Now, why does thrombosis occur in some cases where the sinuses of the dura mater, or the parts covering them, are wounded, and not in other cases where the lesions are strictly analogous? This difference must be ascribed to an abnormal tendency on the part of the blood itself to coagulate, which is present in one set of cases, and not in the other. Indeed, it is possible that traumatic thrombosis of the cerebral sinuses never occurs unless the coagulability of the blood itself happens to be considerably increased, or the condition of the blood in respect of readiness to coagulate is analogous to that which various crystallizable solutions must possess in order for crystals to form.

If this view is correct, of which there seems to be but little if any doubt, abnormal coagulability on the part of the blood itself must be looked upon as the predisposing cause, and fractures which lay open the veins of the diploë or the walls of the sinuses, together with the curdling action of the atmosphere on the blood at the gaping apertures in these vessels, as well as the presence of foreign bodies in the calibre of the sinuses, must be considered as the exciting causes in most instances of *traumatic* cerebro-venous thrombosis. I may here remark that I am acquainted with but one or two forms of local injury which lead the blood to clot in the larger veins during life when its coagulability is not increased, and they produced by the application of ligatures, and by amputation. In such cases the blood coagulates because all motion in it has been arrested over a certain space, and the coagulum usually extends from the place of ligation as far as the nearest collateral tributary having some considerable size. This is the simplest of all the forms of thrombosis.

In like manner coagula form in certain of the veins when they have been divided, as, for example, in the operation of amputation. I remember, however, one thigh-stump in which I found on dissection that the femoral vein was occluded with blood-clot, not beginning at its cut extremity, but at the first valve above the cut extremity and extending therefrom up to the next tributary, the cut end being empty and contracted for about three-fourths of an inch. In like manner also coagula would form in the cerebral veins

and sinuses of the dura mater should the blood-stream therein be arrested by mechanical violence or traumatic agencies in any way analogous to the above. Under such circumstances it is only the portion of the blood which is completely stagnant, that coagulates, unless perchance the coagulability of the blood itself, at the same time, happens to be considerably increased.

2. *Causes of the Inflammatory variety of Cerebro-venous Thrombosis.*

—A perusal of the cases belonging to this class which are related or referred to in the first part of this essay shows very clearly that some local inflammatory disorders of the head, or of the parts contained therein, much oftener give rise to thrombosis of the cerebral veins and sinuses of the dura mater than others. For example otitis interna was the starting point of this affection in 33 instances; facial anthrax, in about 30; facial erysipelas, in 3 (including 1 to be related hereafter); ozæna, in 2 (including 1 to be related hereafter); traumatic caries of the skull, in 3; traumatic inflammation of the skull and neighbouring parts without caries, in 2; suppurating wounds of the scalp, the skull being uninjured, in 1; suppurative diseases of the hairy scalp, such as chronic eczema, etc., in 2; idiopathic abscess of the eye-socket, in 3; extensive purulent infiltration following suppurative parotitis, in 1; purulent meningitis, in 4 cases, and this disorder was probably the starting point of the thrombus-formation in several other instances. Thus, it appears that although a considerable variety of inflammatory affections may produce thrombosis of the cerebral sinuses, suppurative inflammation of the ear and carbunculoid or furunculoid inflammation of the face occasion this disorder much more frequently than all the others put together, namely, in about three-fourths of all the cases. Now let us inquire more closely into the method by which internal otitis, on the one hand, and facial anthrax, on the other, bring about the formation of coagula in the sinuses of the dura mater; and, after that, ascertain, if we can, the reason why these diseases are so much more apt to be followed by cerebro-venous thrombosis than the other suppurative inflammations which so frequently attack the parts entering into the composition of the head.

With regard to suppurative otitis, it was found that in 29 out of the 33 cases above mentioned, disease of the temporal bone in the shape of caries or necrosis was the connecting link between the affection of the ear and the affection of the sinuses. It is probable that in these cases the disease of the bone caused the blood to coagulate in the minute veins of the diploë in the first instance, and that these small coagula afterwards extended themselves by prolongation until they entered and occluded the corresponding veins of the dura mater. In giving the rationale of this occurrence Von Dusch justly observes: "In thrombosis of the sinuses, the result of caries of the bones of the skull, the peculiar conditions of the veins of the diploë [that is, their uncontractible state and gaping apertures

above-described], also appear to me to play an important part. 'The necrosis of the individual layers of bone, resulting from the process of ulceration in the bone, must necessarily diminish the supply of blood from the bone to the large venous trunks, and it will even happen in many instances that the supply of blood from the bone to certain of these is completely arrested. But as a shrinking of the calibre of these vessels is impossible, as already remarked, the diminished or arrested supply of blood leads to stagnation, and the formation of thrombus in them, which may extend into the sinus. We should thus have to regard the thrombus in the sinuses in such cases as propagated, that in the small veins of the diploë as primary and dependent upon the comparative excess in their calibre' (*op. cit.*, pp. 100, 101).

But caries (or necrosis) of the petrous portion of the temporal bone is not always the connecting link between internal otitis and thrombosis of the cerebral sinuses, for among the cases related above are four in which internal otitis produced thrombosis of these vessels without the intervention of either caries or necrosis. In these four cases the starting-point of the clot-formation appears to have been the inflamed and suppurating part of the ear, or rather some of the venous radicles belonging to this part. One of Dr. Dickinson's cases, also related above (see Case XIV.), clearly illustrates this point. At the autopsy of this case a small vein which passed directly from the diseased tympanum into the right lateral sinus was found filled with coagulum and converted into a solid cord thereby. Thus, it appears that in this case a thrombus whose formation commenced at the suppurating tympanum extended itself along the canal of a small vein, in a direct manner from the tympanum into the corresponding lateral sinus, which in the end it completely filled, occasioning also a secondary phlebitis therein.

In a manner closely analogous to this does facial anthrax, as well as facial erysipelas, ozæna, etc., produce thrombosis of the cavernous and other sinuses. In such cases the process of coagulation commences in some minute branch or branches of the facial or frontal vein which are in relation with the suppurating parts, and travels along the facial or frontal vein and its anastomoses into the ophthalmic vein, and so on, into the cavernous sinus.

The correctness of this statement is clearly proved by the post-mortem records of the cases of facial anthrax, etc., related above. For example, the autopsy in Case XXI. revealed an abscess as large as a small nut in left part of upper lip; surrounding tissues infiltrated with matter; a branch of the facial vein extending from the abscess to the inner canthus of the left eye contained thin matter throughout; it anastomosed with the ophthalmic vein. The latter vein and the cavernous sinus were filled with a thick, chocolate-coloured liquid, containing streaks of puriform matter. The walls of these vessels were inflamed. The affection extended

through the circular sinus to the right cavernous. The autopsies in Cases XXIII., XXV., XXVI., XXXVIII., XL., and L. strongly support the same view; and the autopsy of no case supports a different view of the method by which facial anthrax and facial erysipelas produce thrombosis of the cerebral sinuses. In the account of Dr. Blachez's case of ozæna (Case XLIX.) also, it is distinctly stated that the thrombosis and secondary phlebitis were traced, at the autopsy, to the nasal ulceration as the starting point.

With regard to the other, or the remaining forms of inflammation and abscess of the head and face which have occasionally led to the occurrence of thrombosis of the cerebral veins and sinuses of the dura mater, Von Dusch aptly says: "A similar view may be taken of extensive sanious inflammations of the cellular tissue, inflammations, which, as is well known, easily lead to phlebitis of larger venous trunks and to the phenomena of pyæmia and metastatic deposits. In such phlegmonous inflammations a greater or less extent of venous radicles is, for the most part, soon destroyed by the inflammatory process, which rapidly spreads and leads to necrosis of the tissues, whereby the supply of blood to the smaller venous trunks is diminished or completely arrested, and stagnation of the blood in them takes place from the absence of the *vis à tergo*. It may, indeed, more readily occur here than in the veins of the diploë that these small vessels collapse and propel their contents into the next branch, by which means the formation of a thrombus in them would be prevented. This may also be the reason why phlebitis does not always ensue in such cases. But if the inflammatory process produces solid infiltration and thickening of the tissues around these small veins, it will happen here, as in the veins of the diploë, that, the supply of blood being diminished, the unyielding nature of the vessels will furnish conditions favourable to the formation of thrombus. These small thrombi grow, and finally reach the larger trunks, and phlebitis ensues in the latter.

The reason why this consequent [or secondary] phlebitis mostly leads to suppuration and destruction of the coats of the vein, and but seldom assumes the so-called adhesive form, lies in the deleterious nature of the thrombus, which, arising in a deposit of various products of decomposition, conveys these by imbibition into the larger vessels" (p. 101). According to this view the formation of coagula in the small veins during life must be regarded as a consequence of stagnation of the blood therein, while those in the larger veins may be represented as occasioned by propagation therefrom; and the accompanying inflammation of the vein-walls may also be looked upon as secondary. Inflammation of the outer coat of the small veins could only be assumed to be a determining cause for the formation of thrombus in so far as the infiltration or induration of the connective tissue around them might prevent the collapse of their walls.

This view is by no means a new one, and allusions to it may be found in

the very suggestive *Rational Pathology* of Henle (ii. 516, 517), who did not overlook the favourable conditions for the formation of thrombus which exist in the non-contractile veins as well as in the sinuses of the dura mater, in the veins of bone, and in veins whose coats are paralyzed, or thickened, or indurated. Henle also remarks that in cases where the blood stagnates in the capillaries from diminished *vis à tergo*, the blood may also lose its motion and coagulate in the veins which spring from these capillaries, and thus phlebitis may result from stagnation in the capillaries. In brief, the method by which various inflammatory disorders of the head and face cause the blood to coagulate in the sinuses of the dura mater and the walls of these vessels to become inflamed, is as follows: In the cases which belong to this category the process of blood-clotting usually commences in some small vein or veins connected with the seat of inflammatory change, as a consequence of blood-stasis therein, and afterwards the coagula extend themselves by prolongation until they reach and occlude the sinuses; and these consecutive thrombi generally undergo puriform softening or disintegration instead of organization, because they have their origin in the decomposing products of the primary inflammatory lesion, the more fluid portions of which are conveyed into the larger vessels by imbibition. The disintegrating thrombi act upon the sinus walls like other deleterious substances, and like foreign bodies in general, and thus cause them to become inflamed.

But the starting-point of the thrombosis was found to be either internal otitis or facial anthrax in about three-fourths of all the cases having an inflammatory origin which I have collected, as stated above. Now why are internal otitis and facial anthrax so much more liable to be followed by thrombosis and phlebitis of the cerebral sinuses than the other suppurative inflammations which attack the parts entering into the composition of the head? These are questions of great practical moment, since the indications for the preventive treatment hang thereon, and we shall endeavour to answer them as fully as we can.

Firstly, with regard to internal otitis. The first cause which we are likely to assign is increased coagulability on the part of the blood itself. No doubt this liquid is abnormally coagulable in all the cases where thrombus forms in the sinuses of the dura mater in consequence of local inflammatory processes; for it is difficult to understand why a few patients having suppurating sores on the scalp, or orbital abscess, or facial erysipelas, or ozæna should get cerebro-venous thrombosis, while the many who suffer from these affections entirely escape, unless the blood is more disposed to clot in the veins of the former than it is in those of the latter. But granting this, the question then arises why otitis interna so much more frequently causes the coagulability of the blood to be increased than the above-named affections, although they are vastly more common than otitis interna?

The last-mentioned circumstance naturally leads us to suspect that the

discrepancy is due to some peculiar features of the morbid process which are generally present in the cases of otitis interna, and are, for the most part, not present in the other cases, such as the occurrence of caries or necrosis on the one hand, and the production of a highly deleterious pus on the other. Now, although caries or necrosis of the skull was present in twenty-nine of the thirty-three cases related or referred to above, in which otitis was attended with thrombosis of the cerebral sinuses, the occurrence of the last-named disorder cannot justly be ascribed to this caries or necrosis, *per se*, because these affections of bone are very often produced in the walls of the cranium by other causes, and when they are so produced they very seldom give rise to cerebro-venous thrombosis; for example, caries or necrosis of the skull was found to be connected with thrombosis of the cerebral sinuses, in all, in thirty-six cases that are related or referred to above, but out of these the caries or necrosis was due to internal otitis in twenty-nine, and to all other causes in only seven instances, while caries or necrosis of the skull is much less frequently produced by internal otitis than by other causes, such as struma, syphilis, injury, etc. In other words, cranial caries or necrosis occurs much oftener unconnected with inflammation of the ear than it does as a result of this disease, but is, at the same time, four times more liable to be attended with thrombosis of the cerebral sinuses when produced by internal otitis than when it results from all other causes combined.

The same question then presents itself in another form, namely, why is caries or necrosis of the skull so much oftener attended with cerebro-venous thrombosis when produced by internal otitis than when produced by other causes? To this some may reply that in cases of ear-disease the caries or necrosis occurs in the pars petrosa of the temporal bone, that is, in a portion of the skull which is closely connected with the lateral sinus; but this answer is not satisfactory, because caries or necrosis is fully as often, perhaps oftener, met with in parts of the skull which bear an equally close relationship to the superior longitudinal and other sinuses of the dura mater, and that, too, without leading to the formation of thrombus in these vessels, except in occasional instances, as is already proven by statistics given above as well as by the records of clinical experience and the observations of practising surgeons in general.

We are, therefore, compelled to attribute this remarkable proclivity on the part of otitis interna to occasion thrombosis of the cerebral sinuses, not to the caries or necrosis of the temporal bone with which it is so often attended, but to something peculiarly deleterious in the purulent matter which is formed by this disease. Furthermore, it is well known to every one acquainted with the subject that, in cases of inflammation of the ear, the discharge is oftentimes dreadfully offensive. Finally, we infer that the remarkable proclivity on the part of internal otitis, above mentioned, is due to the presence of some peculiar ichor or acrid sanies in the purulent

secretion, a result perhaps of putrefactive changes, which causes the blood to coagulate first in some of the small veins connected with the seat of inflammatory change, and afterwards in the sinus of the dura mater, wherein they empty, which also permeates the thrombus by imbibition, causing it to undergo disorganization instead of organization, and the vein or sinus walls to become correspondingly inflamed. And it is highly probable that thrombosis of the cerebral sinuses was produced in the same way in some at least of the four cases of internal otitis related in the first part of this essay, wherein thrombosis of these vessels occurred without the intervention of caries or necrosis.

Again, with regard to facial anthrax. It was found, as already stated, that in about 30 of the cases having an inflammatory origin, the thrombosis of the cerebral sinuses resulted from furunculoid or carbunculoid disease (anthrax) of the face; that in every one of these cases where the veins proceeding from the anthrax were subjected to examination at the autopsy, their calibres were filled with softening thrombi and their walls were inflamed; and that the progress of the thrombosis and phlebitis was traceable through these vessels from the anthrax to the ophthalmic vein and cavernous sinus, and in occasional instances also downwards into the veins of the neck. We have likewise shown that furunculoid and carbunculoid inflammation of the face is a very fatal disease. Out of 28 cases mentioned in the first part of this essay, but 2 recovered. In 15 cases Mr. Paget saw, but 1 got well; and in a grand total of 45 cases we can find but 5 recoveries. Furthermore, we have shown that this enormous fatality is mainly due to the fact that facial anthrax excites thrombosis and secondary phlebitis in the veins connected therewith, which are rapidly propagated into the ophthalmic vein and cavernous sinus, etc., on the one hand, and into the external jugular vein, etc., on the other. Now, why does it happen that facial anthrax is so much more liable to produce thrombosis and phlebitis than any other suppurative inflammation with which we are acquainted?

Prof. Güntner holds that the short stiff connective tissue of the lips, nose, septum narium, etc., specially favours the occurrence of thrombosis in the veins belonging to these parts. This explanation, however, does not appear to me satisfactory, since suppurating wounds and ulcers of the lips and face in general, are not particularly liable, nor even apt, to be followed by thrombosis, phlebitis, and pyæmia, or either of them, which could hardly obtain if the connective tissue of these parts exerted so baleful an influence upon the veins. The truth is, this form of facial inflammation is entirely unlike any other disease known in this country. It has been called "malignant pustule," but improperly so, because it runs its course entirely without the history of contagion which belongs to that disorder. It has also been called, and with less impropriety we think, "malignant carbuncle" of the face. No doubt its peculiar malignancy is due to some

special condition of the anthrax itself, to some peculiarly acrid sanies of a septic origin and character which is developed in the foci of suppuration. We must suppose that a peculiarly intense poison is formed in these carbuncles, under circumstances that we do not exactly understand, which, on entering the veins by absorption, causes the blood in them to coagulate and to undergo putrefactive changes with great rapidity, and their walls to become destructively inflamed, in order to explain the phenomena of this disease. Moreover, this conclusion affords an important indication for the treatment of this disease.

But it may be asked whether in these rapidly fatal cases of facial anthrax the inflammation of the vein-walls does not precede the formation of coagulum in the vein-calibres—whether the phlebitis does not precede and induce the thrombosis. We reply that, on autopsy of cases belonging to this category, the vein-walls are usually found to be not at all, or but slightly, inflamed in parts where the thrombus is newest, while they are considerably inflamed only in parts where the coagulum is of a considerably older date—a circumstance which would not obtain if the thrombosis followed and depended upon the phlebitis for its production. We may, however, with propriety here remark, that a slight glance at the history of the formation of coagula in the veins during life shows that it is intimately connected with the history of phlebitis, and that widely different views concerning their origin and relationship have prevailed at different times. At first the clots were regarded as inflammatory exudations which were thrown out upon the inner surface of inflamed veins (*Hunter*). Afterwards it was ascertained that the clots were genuine coagula that had been formed from the blood itself, and then the opinion that the blood coagulated in these cases as an immediate consequence of the phlebitis, which was supported by the authority of Cruveilhier, generally prevailed. But it was reserved for Virchow, in his classical work on thrombosis, to clear up the matter and to show that, in a large majority of instances, the coagulation of blood in the veins precedes the inflammation of their walls, and that primary phlebitis with subsequent thrombosis much more rarely occurs.

3. *Causes of the Marasmic Variety of Cerebro-venous Thrombosis.*—There are four parts of the venous system in which the blood is especially liable to coagulate in consequence of debilitating influences and marasmus, during life, namely, the right chambers of the heart, the veins of the lower extremity, the veins of the true pelvis, and the sinuses of the dura mater; and of the last-mentioned, more particularly the superior longitudinal and lateral sinuses. The circumstances which specially favour the formation of coagula in these sinuses, in marasmic subjects, are the dilations of calibre, the triangular shape, and the transverse bands (*chordæ Willisii*) projecting inwards from the walls, whereby the blood-stream is retarded, and more or less of blood-stasis (stagnation) is produced. Be-

sides, the cerebral veins, for the most part, empty into the superior longitudinal sinus in such a manner that the streams coming from them flow in directions which are either at right angles with the course of the blood in the sinus, or even oblique from behind forwards, that is, in directions more or less considerably opposed to the natural course of the blood in the sinus; and this circumstance favours the retardation of the blood-stream, not only in the sinus, but likewise in the cerebral veins themselves. Thus, we perceive that even under normal conditions the blood-current in the cerebral sinuses is comparatively slow, especially in the superior longitudinal, and the veins connected therewith; and when certain pathological conditions supervene which tend to more or less considerably diminish the force and rapidity of the general circulation, the retardation of the blood-flow, or the approach to blood-stasis, in the cerebral veins and sinuses is proportionally augmented, and a state of things correspondingly favourable to the formation of thrombus is produced. Also, we should, in this connection, again call attention to a circumstance of considerable importance which Henle was the first to point out, namely, that when the blood stagnates in the capillaries from diminished *vis à tergo*, as may readily happen in advanced cases of marasmus and debility, the blood may also lose its motion in the veins which spring from these capillaries, and thus thrombosis of these veins may result from stagnation in the capillaries, especially if, at the same time, the blood itself should be unusually disposed or inclined to coagulate.

But a perusal of the cases related above shows that other causes besides retardation of the blood-flow are concerned in the production of marasmic thrombosis of the cerebral veins and sinuses of the dura mater. And, first of all, the blood itself must be in a condition to readily coagulate, that is, it must be more coagulable than natural, or in a morbid state, whereby its coagulability is at least considerably increased. In perusing the marasmic cases of cerebro-venous thrombosis quoted above from the reports of Gerhardt, Von Dusch, West, Bouchut, Fritz, Crisp, Andrew, Murchison, Forster, Ogle, Janeway, and Charcot, I have been particularly struck by one circumstance, namely, in almost every instance the subject was obviously labouring under some blood-disorder of importance when the thrombosis occurred, and had been so affected, in most instances, for some time prior to its occurrence.

Moreover, on scrutinizing these cases we find that, although the nature of the blood-disorder differed considerably in different instances, yet all of them agreed in one particular, to wit, in exhibiting an abnormal tendency on the part of the blood to coagulate. For example, in Dr. Gerhardt's cases of diarrhœa and cholera infantum, the coagulability of the blood in the vessels became increased because its volume was rapidly diminished, and substance inspissated in consequence of the withdrawal therefrom of a great quantity of watery liquid to support the abdominal discharges. In

some cases mentioned by Von Dusch, the coagulability of the blood also became increased because its volume was suddenly diminished by excessive bloodletting, and in a somewhat analogous case related by Mr. Forster the coagulability of the blood was increased, in part, by a succession of hemorrhages to which the sloughing of a fungous tumour of the dura mater subjected the patient; in another set of these cases the increased coagulability of the blood was due to *hyperinosis*, which resulted from pneumonia in Dr. Ogle's case (No. LXVII.), from typhoid fever and pleuro-pneumonia in a case mentioned by Von Dusch, and from the puerperal state in a case also mentioned by Von Dusch; finally, in the cases of marasmus, anæmia, and debility, the result of various wasting diseases of a chronic character, such as abscess, vertebral caries, scrofulosis, lung-phthisis, chlorosis, syphilitic cachexia, albuminuria, ague cachexia, chronic pleurisy, etc., that are related by Fritz, Von Dusch, West, Bouchut, Andrew, Murchison, Ogle, Janeway, etc., the increase of coagulability of the blood was probably due to the increase of its white corpuscular element, or the state of leucocythæmia which usually attends these disorders.

This abnormal tendency on the part of the blood to coagulate is doubtless one of the most important of the agencies which are concerned in producing the marasmic variety of cerebro-venous thrombosis. There is, however, another cause which is almost always concerned in producing this disorder, that possesses nearly equal importance. It is the enfeebled action of the heart, or the diminished force of the circulation which is usually present in the cases belonging to this category as an immediate consequence of the anæmia, debility, and marasmus. There results from this weakening of the cardiac contractions a corresponding tendency on the part of the blood to stagnate in the capillaries and to cease to move in the veins beyond them from want of the *vis à tergo*. This point in the etiology of this affection is also important because the vigour of the heart's contractions can be increased by remedies.

Another cause which probably exerts some influence, in occasional instances, in producing the marasmic variety of cerebro-venous thrombosis, is vaso-motor paralysis of the cerebral bloodvessels, which, by destroying the contractility of these vessels, would allow them to become expanded by the force of the blood-stream, and would favour in a corresponding degree the occurrence of stasis and coagulation, especially in the capillaries and veins.

Again, age exerts an important influence in producing the marasmic variety of this affection. Its victims are mostly found among the very young and the aged. Infants and young children are especially liable to be attacked by it because they are exposed to the occurrence, not only of the diseases which produce it in the more advanced periods of life, but also of special diseases, such as the colliquative diarrhœa and cholera infantum, which, as we have shown above, may rapidly increase the coagu-

lability of the circulating blood by diminishing its volume or inspissating it, on the one hand, and, at the same time, may induce it to stagnate in favourable localities by weakening the cardiac contractions and diminishing the vascular tension, on the other. Furthermore, during infancy and childhood the brain constitutes a much larger proportional part of the whole body, amounting then to one-tenth or one-fifteenth thereof, than it does in adult years, when it becomes reduced (comparatively) to one-fortieth or one-fiftieth part of the whole body. Besides, the watery brains of infants are especially prone to shrink and thus cause the cerebral veins and sinuses to expand their calibres in order to fill up the resulting vacuum, on the occurrence of any disease which rapidly withdraws the serum from the blood and compels it in turn to withdraw the serum from the substance of the brain, as well as from the parenchyma of other organs, by the process of absorption. Aged people, also, are especially liable to be attacked by cerebro-venous thrombosis, because the coagulability of their blood is prone to become increased from senile marasmus, while the cardiac contractions grow weaker from the decay incident to advancing years, and the cerebral veins and sinuses become expanded and the blood-stream sluggish in them in consequence of the shrinkage to which their brains are exposed from senile atrophy. Moreover, in aged people the force of the blood-stream is apt to be weakened in the capillaries, veins, and sinuses of the brain, by the occurrence of atheroma and fatty degeneration in the coats of the cerebral arteries, which renders them more or less stiff, non-elastic, and non-contractile, and thus still further lessens the *vis à tergo* of the senile heart. But, although marasmic thrombosis of the cerebral veins and sinuses of the dura mater is most frequently met with in aged persons and young children, it may also occur at any other period of life when some disease is present which induces a cachectic state of the system with feeble heart-action, and, at the same time, increases the coagulability of the blood.

Furthermore, we should remark that the causation of cerebro-venous thrombosis is usually a very complex affair, and that not a solitary one but several of the factors above mentioned are jointly concerned in the production of almost every individual case. We should also state in this place that we have discussed the etiology of this deadly disease as thoroughly as we could, with a hope that we might discover in this way what the causal indications are for its treatment, and thus acquire some means to prevent its occurrence and to obviate its mortality. These indications, however, will be taken up and duly considered in the appropriate place, that is, under the head of treatment.

Anatomical Appearances or Changes.—On examining post-mortem the veins and sinuses affected with thrombosis they usually present externally a more or less swollen or distended appearance, and are more or less stained with a reddish or a brownish hue. On opening them the distension

is found to be due to the thrombus which fills up the calibre and dyes the walls with its colouring-matter. The thrombus itself, if recent, is usually dark-red or brown in colour, pretty firm in consistence, rather dry, somewhat elastic, laminated, and more or less strongly attached to the vessel which contains it. As it grows older, however, the red corpuscles gradually disappear, and at the end of ten days or a fortnight it may be so completely decolourized as to resemble a plug of pure fibrin. But in the cases of inflammatory origin it almost always undergoes softening or disintegration, and sometimes putrefaction. In such cases, also, the walls of the affected veins and sinuses are exceedingly apt to be inflamed. When the thrombus softens the disintegrating process usually commences at its centre, and the liquefied material varies in colour and consistence from that of wine- lees to that of cream-like pus. More frequently, however, it has a dirty reddish-brown appearance, and the consistence of purulent matter. Examined with the microscope the disintegrating thrombus, even when puriform in appearance, is found to consist of granular fibrin, oil-drops, some red corpuscles more or less altered or broken down, and many leucocytes. When the walls of the affected veins and sinuses are inflamed they become thickened and more or less softened, their capillary vessels injected, their inner surface tomentose, roughened, and sometimes eroded or ulcerated, as well as dark-red in colour. When erosions or ulcerations are present, genuine purulent matter can also be found intermingled with the disintegrating thrombus. Furthermore, the veins which lie on the distal side of the thrombosed sinus are generally gorged with blood, the pia mater and cerebral substance œdematous, with more or less serous effusion in the ventricles, and in many instances blood also is extravasated into the meninges or into the cerebral substance.

In *nineteen* of the cases related or referred to above, cerebral or meningo-cerebral hemorrhage occurred. This complication, however, is met with very much oftener in the marasmic than any other variety. Of these nineteen hemorrhagic cases sixteen had a marasmic origin, and an examination of them shows that cerebral hemorrhage is most liable to occur in cases where the superior longitudinal or straight sinuses, or the cerebral veins themselves, are thrombosed. But secondary phlebitis is met with very much oftener in cases having an inflammatory than in those having a marasmic origin. Besides, in these cases the inflammatory process is exceedingly apt to spread from the sinus-walls to the contiguous membranes of the brain, thereby inducing a meningitis which is often purulent in character; and sometimes the inflammatory process spreads also to the brain-substance and induces inflammatory softening and abscess therein. Finally, the cases having an inflammatory origin are frequently, and the marasmic cases occasionally, complicated with the occurrence of hemorrhagic infarctions in the lungs, of so-called metastatic pneumonia and

pleurisy, of so-called secondary abscesses in the lungs, liver, etc., and with the phenomena of pyæmia or septicæmia.

Symptoms and Course.—Different observers give somewhat different views of the phenomena produced by thrombosis of the cerebral veins and sinuses of the dura mater. We shall, however, present only a brief sketch of the symptoms which the leading varieties of this disease present, and illustrate it with condensed reports of some additional cases. Dr. Hubner (*Archives der Heilkunde*, ix. 5, p. 417, 1868) gives the following instance of marasmic thrombosis of the cerebral sinuses, wherein, as usually obtains, the diagnosis was not made during life, together with a critical analysis and interpretation of the symptoms:—

CASE LXX.—The patient presented at first general head-symptoms, but soon afterwards neuralgia of the right supra-orbital nerve, blepharoptosis on the same side, œdema of the corresponding eyelids, loss of hearing, and finally facial paralysis on the right side with blood-stases in the corresponding frontal veins. These phenomena were all very transient. On *autopsy* there were found thrombosis of the superior longitudinal and transverse sinuses, thrombosis of the right cavernous sinus, and thrombosis of the right ophthalmic vein.

Dr. Hubner thinks the formation of the thrombus in this case commenced in the superior longitudinal sinus and extended therefrom into the transverse sinuses; the obstruction of these vessels with coagulum brought on an intense collateral stasis of blood in all the sinuses at the base of the brain. The stasis thus produced in the cavernous sinus led to dilatation of the collateral veins of the face, and to compression of certain nerves, including the great sympathetic; hence to dilatation of the cerebral arteries. When the thrombosis had extended as far as the cavernous sinus, the phenomena of stasis and compression diminished in intensity. It is easy in this way to explain the mutability of the symptoms, which was indicated by Lebert as one of the characteristic phenomena of thrombosis involving the cerebral sinuses.

Dr. Hubner remarks concerning the phenomena which result from thrombosis of the cerebral sinuses: The stasis in the cerebral veins generally gives rise to characteristic cerebral symptoms. Venous dilatation may also exist in the collateral vessels of the walls of the cranium, or rather it may show itself in the veins which unite the vessels of the face to those of the cranium. In the latter case vascular dilatation has considerable diagnostic importance. In obstructions of the transverse sinuses one may observe dilatation of the emissary veins of Santorini and of the mastoid vein. The parietal veins also are dilated in cases where the longitudinal or ethmoidal sinuses are obstructed. When the ophthalmic vein which carries to the cavernous sinus the blood of the frontal vein, of the ophthalmic bulb, of the eyelids, and of the ocular muscles, is obstructed with thrombus, one may observe a venous injection in the skin of the forehead, with œdema of the eyelids, of the globe of the eye, and even of the ocular muscles; hence doubtless arises the prominence of the eye often noticed in cases of this kind (*Archiv. Gén. de Méd.*, 1869, vol. i. pp. 357–359).

Dr. Hermann Weber (*Medico-Chirug. Transact.*, vol. xliii. pp. 177-180) relates the following case in which erysipelas of right side of face, etc., was followed by thrombosis of right ophthalmic vein and of right cavernous and circular sinuses, meningitis, and death. The account of the symptoms and *post-mortem* appearances, although much abridged, is very interesting and useful in this connection :—

CASE LXXI.—F. M., aged 25, a pale and delicate-looking shoemaker, was attacked by erysipelas of right cheek and right eye on December 14th. At the end of a week the erysipelas had almost disappeared, and the patient was considered convalescent, when, on December 23d, he began to complain of dull headache; pulse 105; body temperature increased. During the next three days the headache increased, there was occasional delirium, grinding of teeth in sleep, twitching of muscles; pupils rather contracted, almost immovable; sickness and constipation with a pulse slow and irregular (60-85). On December 27th, he became drowsy; pupils wide and sluggish; left arm slightly paralyzed. On December 30th, drowsiness much increased; pupils dilated and insensible; paralysis of left side extending now to leg as well as arm. The degree of this paralysis varied at different times, but a remarkable, although transient improvement of this symptom and all the others occurred on December 31st, when the drowsiness almost disappeared, the patient became conscious, and was able to speak to his friends; in the following night, however, the coma returned, the pulse became very weak and frequent, the breathing irregular, until death ensued on January 2d.

Autopsy 26 hours after death.—Upper part of nose, lids of right eye, and surrounding tissue slightly swollen; a moist light-brown scab from an almost dried blister is seen on right side of nose; a similar scab on upper lid of right eye, slight œdema of pia mater on both sides; purulent meningitis on lower surface of anterior lobe of right hemisphere; lateral ventricles contain about two ounces of turbid fluid; their walls slightly softened, but the rest of the brain-substance normal. The right cavernous sinus feels hard and enlarged; its walls are thickened and its calibre filled by a grayish-red coagulum strongly adherent to the lining membrane, which appears not quite smooth. The clot is composed of several layers; the exterior being grayish-red, the middle purer red, the centre cherry-red, and softer than the others. The internal carotid and the nerves in the walls of the sinus appear unchanged. The ophthalmic vein, in connection with the sinus, contained a dark coagulum, rather firmly adherent to the thickened lining membrane, but the rest of this vein, as well as the veins of the face, etc., were not examined, because it was not permitted to open the orbit and the tissues of the cheek. Blood in circular sinus coagulated; that in left cavernous sinus not quite coagulated; their walls normal; the other sinuses exhibited nothing pathological. Heart hypertrophied; lungs and abdominal organs normal; no secondary abscesses.

The brain-symptoms in the above case resemble in many respects those caused by acute hydrocephalus, which was, in fact, diagnosed by two physicians who examined the patient without being acquainted with his history. The changing character of the hemiplegia was remarkable, and not less so the striking improvement of all the symptoms two days before death; but the latter phenomenon has occasionally been seen to occur in the most deceptive manner in other diseases of the brain (*Weber*).

The fact that the appearance of head-symptoms was preceded by erysipelas of the face, especially of the right eyelids and side of the nose, that the right ophthalmic vein and right cavernous sinus were distended with thrombus and their walls inflamed, and that there was circumscribed purulent meningitis confined to the under surface of the anterior lobe of the

right cerebral hemisphere, renders it pretty certain that the endocranial affection was caused by the facial erysipelas, and that the ophthalmic vein was the medium of communication. It is not improbable that the coagulation of the blood commenced in the capillaries and venous plexus of the right side of nose, cheek, and eyelids, and proceeded thence to the right ophthalmic vein and cavernous sinus, as it did in Cases L. and LI., related in a previous paper, which are strictly analogous to the above.

The inflammatory thickening that was found in the coats of the ophthalmic vein and cavernous sinus might lead to the view that phlebitis (properly so called) was the first link in the chain of pathological processes, and that the coagulation of the blood and the alteration of the clot in these vessels were only the consequences of inflammation of their walls. As we know, however, that the presence of blood-clot in veins, and the changes in composition which it is very liable to undergo, are in themselves sufficient to cause inflammation of the vein-walls, on the one hand, and that inflammation of the vein-walls alone is not sufficient to cause thrombosis on the other, the inflammatory thickening above mentioned cannot be considered to possess any value as evidence that the erysipelatous process was propagated from the face to the membranes of the brain by idiopathic phlebitis, instead of thrombosis and secondary phlebitis.

Dr. Hermann Weber (*Medico-Chirurg. Transact.*, vol. xliii. pp. 182–186) has also reported the following case of cerebro-venous thrombosis resulting from syphilitic ozæna, in which the symptoms of thrombosis were complicated with those of pyæmia. The following brief account of it will likewise prove useful in this connection :—

CASE LXXII.—A waiter, aged 24, of scrofulous parentage, had been afflicted with constitutional syphilis for about six years, and with syphilitic ozæna for over one year.

February 4. He has headache, especially in frontal region; rather increased by shaking the head; not increased by tapping on the forehead. Nose flattened and slightly swollen; nostrils blocked up by dry brownish crusts; fetor moderate; pressure on nose not painful; pupils symmetrical and responding well to light; pulse regular, about ninety; bowels costive.

7th. Appearances of nose unchanged; headache constant, but increased at night; yesterday he was often delirious; to-day he is drowsy, but can be roused, and then answers reasonably; pupils rather dilated and sluggish. Has had repeated rigors. Spleen yesterday found perceptibly enlarged; to-day there is in addition, tenderness of lower part of left side, and a soft friction-sound is occasionally heard.

9th. Somnolency increased; carphology; muttering delirium; muscular twitching, especially in thighs; ptosis of left upper eyelid; motions of left eye much restricted from paralysis of external rectus; pupils (both) wide and sluggish; tongue dry; pulse 120–125, very small; friction-sound over lower part of left chest again noticed; dullness increased.

10th. Complete coma; right-sided hemiplegia; left eye almost closed; its conjunctiva slightly injected. Death on the 11th.

Autopsy 22 hours after death.—Examination of eye-socket not allowed. Circumscribed purulent meningitis limited to the inferior surface of anterior lobe of left cerebral hemisphere; veins of pia mater distended and filled with dark coagula. Lateral ventricles contain about three drachms of not quite transparent fluid.

Superior longitudinal sinus contains a dark-red coagulum, rather firmly adherent to its walls, which, however, are not perceptibly altered. Left cavernous sinus filled by a crumbling slightly cohesive thrombus of reddish-gray colour. The external part thereof adheres closely to the walls. The central part is softened to the consistence of thick pus, and has a brownish-red colour. The walls of this sinus are considerably thickened, as are also those of the ophthalmic vein (as far as examined) which is likewise filled by a dry, rather dark coagulum. The internal carotid artery and the nerves in relation with the left cavernous sinus appear not materially changed, excepting increased thickness of the surrounding areolar tissue. The left inferior petrosal, the circular, and the right cavernous sinuses contain a dark-red coagulum, which adheres but slightly to the unchanged lining membrane. The other sinuses of the dura mater contain a loose coagulum which does not adhere at all. Cranial bones not carious.

The softened part of the thrombus of left cavernous sinus, examined with the microscope, contains: 1st. Small granules, which are dissolved by acetic acid; 2d. Aggregations of such granules into irregular-shaped bodies (round, oval, crescentic), which are likewise dissolved by acetic acid, nowhere exhibiting the characters of pus globules; 3d. Other granules and aggregations of granules, dissolvable by ether and not by acetic acid; 4th. Oil-globules of various size; 5th. Blood-globules of different shapes, some being much shrunk, some exhibiting a tendency to the star form, others being granular on the surface.

A pint of purulent effusion in left pleural cavity; secondary abscesses in lungs and liver. Spleen enlarged and much softened.

The dropping of the upper lid of left eye, as well as the paralysis of the left external rectus, in this case, are easily accounted for by considering the relation which existed between the third and sixth nerves and the thrombosed cavernous sinus, together with the thickened state of the surrounding connective tissue, since these nerves may have been compressed thereby.

The symptoms referable to the cerebro-venous thrombosis were frontal headache, delirium, stupor, dilatation of pupils, swelling of left eyelids, injection of conjunctiva, ptosis of left upper eyelid, paralysis of left external rectus oculi, right-sided hemiplegia, and coma. The symptoms referable to pyæmia were rigors occurring at irregular intervals, marked increase of body-heat, enlargement of spleen, soft friction sound and dulness over lower part of left chest, muttering carphology and other muscular twitchings, dryness of tongue, and great frequency of pulse. With regard to the diagnosis, an attentive consideration of the history of the patient, and of his symptoms as a whole, employing at the same time the process of exclusion in their interpretation, could hardly fail to lead any one familiar with the subject of thrombosis of the cerebral sinuses, together with the symptoms of pulmonary infarction and pyæmia, to a correct understanding of the case.

The thrombosis probably commenced in the veins directly connected with the nasal ulceration, and proceeded thence by prolongation through the anastomosing branches of the facial vein into the left ophthalmic, and the left cavernous sinus. The thickening of the walls of these vessels was the result of inflammatory action excited therein by the presence of a disintegrating thrombus; and the purulent meningitis in turn was due to the

extension of the inflammatory process from the walls of the ophthalmic vein and cavernous sinus to the neighbouring membranes of the brain. The thrombosis of certain veins of the pia mater, which was found on autopsy, resulted in all probability from the purulent meningitis, and the formation of thrombus in the superior longitudinal sinus was occasioned by the extension of the thrombi from the cerebral veins to the calibre of the sinus.

But a review of the various cases of thrombosis of the cerebral veins and sinuses of the dura mater, heretofore presented, conclusively shows that the symptoms attending this affection when produced by inflammatory causes differ considerably from those which are present when it results from debilitating or marasmic influences. Without descending too much into particulars we may remark that in the cases of inflammatory origin we are much more apt to find phlebitis of the sinuses together with an inflammation of the membranes of the brain which has been lighted up by an extension of the inflammatory process from the sinus-walls to the contiguous membranes of the brain, on the one hand, as well as the phenomena of pulmonary infarction and septicæmia, on the other, than in the cases having a marasmic origin. In fact, the marasmic variety of cerebro-venous thrombosis is but seldom attended with secondary phlebitis, septicæmia, and the so-called metastatic pneumonia, while the inflammatory variety is often attended with these consequences. In the marasmic cases, then, we but seldom or never find the symptoms complicated with, or masked by, the phenomena of secondary meningitis, of septicæmia, or metastatic pneumonia.

What are the consequences, so far as the brain is concerned, of plugging up the cerebral veins and sinuses of the dura mater with coagulum? They are the following: venous congestion, œdematous infiltration of the pia mater, and of the brain-substances itself, together with cerebral hemorrhage in a large proportion of the cases. In other words, the substance of the brain becomes compressed by the engorged veins, the exuded serum, and the extravasated blood; or, speaking more correctly, the cerebral capillaries become compressed in this way, and the nerve-filaments and ganglion-cells of the cerebral substance deprived of nutrient blood. The symptoms resulting from thrombosis of the cerebral sinuses are, therefore, the symptoms of cerebral anæmia, namely, sopor with or without convulsions, pain, paralysis, coma, death. It will be observed that the symptoms are much the same as when the anæmia of the brain-substance is produced by some other cause.

The question then arises whether it is possible to make a differential diagnosis between cerebral anæmia due to thrombosis of the cerebral sinuses and that due to other causes. Von Dusch thinks that when infants are the subjects such a diagnosis can sometimes be made. He points out that in such cases as those related by Dr. Gerhardt the symptoms taken to-

gether indicate with tolerable certainty the presence of cerebro-venous thrombosis. When profuse diarrhœas in weakly children are followed by the above-mentioned cerebral symptoms, with depression of the fontanelles and overlapping of the cranial bones, accompanied by an unequal distension of the two external jugular veins, the diagnosis of cerebro-venous thrombosis is highly probable, the disease being located on the side where the vein is least distended; but the absence of the last-named phenomenon does not exclude the possibility of thrombosis of the cerebral sinuses, because if the superior longitudinal sinus alone, or both lateral sinuses simultaneously, happen to be the seat of the disease, no inequality with respect to distension can be observed in the two external jugular veins. In most of the marasmic cases, however, the diagnosis is very uncertain and can only be based on a general consideration of all the symptoms, or be arrived at by the exclusion of other affections.

In the cases which have an inflammatory origin the symptoms that present themselves are usually due not so much to cerebral anæmia as to certain morbid changes in the membranes and substance of the brain, and to septicæmia with pulmonary infarctions or so-called metastatic pneumonia. When, however, in cases of chronic otitis, or facial furuncle, or facial erysipelas the above-mentioned symptoms of cerebral anæmia supervene, and cannot otherwise be accounted for, they should lead us to strongly suspect that thrombosis has occurred in the sinus of the dura mater which lies next to the inflamed part; and in cases of facial anthrax and of facial erysipelas this diagnosis will be still more probable if there are also œdematous tumefaction with incomplete closure of the eyelids and protrusion of the eyeball on the affected side of the head.¹

The mutability or transient character of the symptoms which obtains in many cases belonging to each variety of this affection is probably due to the fact that the degree of cerebral anæmia is not constant but varies according to the growth of the thrombi themselves, as well as in accordance with the freedom with which the blood escapes from the brain through the collateral channels.

Ophthalmoscopic Symptoms of Cerebro-venous Thrombosis.—But few observations on this point have been placed on record. Dr. Bouchut, however, (*L'Union Médicale*, 1869) concludes, from his own experience with the ophthalmoscope in cases of cerebral disease, which appears to have been extensive, that hyperæmia of the retinal veins, when attended with stasis and the formation of coagulum, denotes repletion of the sinuses and thrombosis of the meningeal veins; that œdema of the papilla indicates thrombosis of the sinuses or of the cerebral veins; and generally

¹ In facial anthrax such symptoms as the following, namely, headache, delirium, stupor, dilatation of the pupil, difficulty in swallowing, incontinence of urine, and coma, pretty uniformly occur.

that in cases where the cerebral circulation is greatly disturbed (as it is in cerebro-venous thrombosis) one may see something analogous in the eye (*Brit. and For. Med. Chirurg. Review*, Oct. 1871, pp. 511, 512). Should these opinions be confirmed by other observers, they will furnish diagnostic signs of great importance.

Treatment.—In this disease art is powerless to dissolve the thrombus or to reopen in any other way the obstructed veins and sinuses of the brain, after the coagulum is formed. In treating this affection, therefore, the physician should mainly direct his attention to the prophylaxis; that is, while treating the various accidents and disorders which, as shown above, are liable to prove fatal by inducing cerebro-venous thrombosis, he should endeavour to prevent the formation of the thrombus itself, and in doing this he must be guided by the causal indications. We will briefly present them for each variety of the disease.

1. With regard to the traumatic variety: the indications for treatment which are derived from a consideration of the etiology of this variety are few and simple. They consist in the removal by surgical means of any foreign bodies which penetrate the sinuses so as to come directly into contact with the blood contained in them, or press upon them externally, so as to narrow their calibre, or obstruct the movement of the blood through them in any other way. They consist also in rendering nugatory the operation of any cause which by increasing the coagulability of the blood promotes the formation of thrombus at the seat of injury, in avoiding excessive blood-letting, in arresting excessive hemorrhages, and in restraining excessive alvine discharges in cases of cranial injury.

2. With regard to the inflammatory variety: inasmuch as the occurrence of thrombosis and phlebitis in the cases belonging to this variety is due to the presence of some deleterious agent of peculiar character, some special ichor, in the inflamed part or suppurating focus, as we have shown above, which by virtue of its own destructive properties causes the blood to coagulate in the veins proceeding from the inflamed part, and in the corresponding sinus of the dura mater, which likewise causes the thrombus itself to disintegrate, and sometimes to putrefy, and the walls of the affected vessels to become inflamed, the causal indications for the treatment of these cases are also very plain. They consist in preventing the development of this poison in the inflamed or suppurating part on the one hand, and in reducing it to a state of inertness, that is, in destroying it, on the other.

Experience has shown that internal otitis, facial anthrax, facial erysipelas, and eczema, but especially the first two, are the inflammatory disorders which are most liable to be attended with thrombosis of the cerebral sinuses. In cases of suppurative otitis we can do much to ward off thrombosis by securing a free outlet for the matter, by extracting the fragments of dead bone as soon as they become detached, and by the persistent use of antiseptic or disinfectant washes, such as chlorine water, liquor sodii chlorinat. suitably

diluted, weak solutions of carbolic acid, pretty strong solutions of sulphite of soda, etc., and the "girondin" disinfectant fluid. An aural surgeon of eminence informs me that the last-named has yielded very satisfactory results in his hands. By employing these means we may keep the purulent matter in the internal ear and neighbouring parts from putrefying, and the ichor above mentioned from forming, or we may destroy it if already formed.

Generally, while treating the local inflammatory affections of the head we can best diminish the risk of cerebro-venous thrombosis by the early evacuation of all purulent collections with free incisions, by cleanliness, and by the unstinted use of antiseptic fomentations and lotions, combined with appropriate internal medication. But when carbunculoid or furunculoid inflammation (anthrax) of the face presents itself, something more is required in order to prevent the development of thrombosis, phlebitis, and septicæmia. The terrible mortality recorded against it above (40 deaths in 45 cases) shows the insufficiency of the plans of treatment heretofore employed. The medication must be more radical and thorough in order to prove successful. The pimple, boil, or pustule which ushers in the disease, that is, the inflammatory focus, wherein the special septic poison which induces the thrombosis, etc., is formed, must be destroyed with an unsparing hand, at an early stage, if we would save the patient. The plan of treatment which has proved so successful in a strictly analogous disease, the malignant pustule of Europe, should be tried in this affection also. Dr. Belles (*Gaz. Méd. de Paris*), a physician practising in the districts of Béja and Faro, in Portugal, where malignant pustule is very frequent in consequence of the number of cattle raised there, says he has treated hundreds of cases of this disease without having noted a single death. The treatment employed by Dr. Belles consists in crucial incision of the boil throughout its whole extent, in depth as well as breadth, and cauterization with chloride of antimony, repeated until bleeding ceases. The gangrenous tissue is completely insensible to both cutting and cauterization (*Med. Record*, Aug. 1873, p. 372). The separation of the eschar should be favoured by the application of antiseptic poultices made of charcoal, yeast, bark, etc., or, better still, by antiseptic fomentations, consisting of carbolic acid (part 1 to 200), or liquor sodii chlorinat. (part 1 to 12), or zinci chlorid. (part 1 to 200), or of the "girondin" disinfectant fluid. Prof. Güntner, of Salzburg, who saved two out of five cases of facial anthrax, recommends especially the constant application of warm fomentations. He found that cold applications were positively hurtful. Mr. Thomas Smith (*Clin. Soc. Transact.*, iii. p. 63) also proposes that the sulphite of soda or magnesia should be systematically administered from the very first in facial anthrax as a preventive of blood-poisoning. At the same time, if the body-temperature ranges high, it may be advantageously abated by giving quinine in full doses, or in such doses as to produce cinchonism.

3. With regard to the marasmic variety: in the cases belonging to this

sort of cerebro-venous thrombosis, also, the causal indications for treatment are but few and plain. In managing the various forms of chronic disease which are attended with marasmus, leucocythæmia, and great debility, and which, as we have shown above, are also liable to result in thrombosis of the cerebral veins and sinuses of the dura mater, the indications are first to lessen the abnormal tendency on the part of the blood itself to coagulate, and second, to prevent the occurrence of blood-stasis in the venous system by supporting the failing powers of the heart and arteries. And here we should remark, that the physician's success in saving or prolonging life in cases of pulmonary tuberculosis, chronic bronchitis, chronic pneumonia, chronic pleurisy, chronic abscess, vertebral caries, chlorosis, leukæmia, scrofulous adenitis, ague cachexia, syphilitic cachexia, infantile marasmus, senile marasmus, and many other debilitating diseases, will largely depend upon his ability to prevent the occurrence of thrombosis in some part of the venous system. Moreover, it is a fortunate circumstance that the remedies which are best adapted to fulfil the above-mentioned indications are, for the most part, also the medicines which experience has shown to be most useful, in a general way, in combating these several diseases. These remedies are the various preparations of ammonia, especially the muriate and carbonate, alcoholic stimulants, quinine, and such cardiac excitants as digitalis and atropia.

After much observation and reflection, I have no doubt that certain preparations of ammonia, especially the muriate, carbonate, aromatic spirit, and the liquor ammonii anisatus of the Prussian codex, are capable of diminishing considerably the coagulability of the blood when it is morbidly augmented, and that too, without inducing debility even when their use is long continued. For this and other reasons I hold the muriate of ammonia to be one of the most valuable medicines with which I am acquainted. It is probable that the spt. ammon. aromat and the liquor ammon. anisat. prove so useful in the bowel complaints of children, when great debility is present, not only because they strengthen the cardiac contractions, but also because they diminish the coagulability of the blood itself. It is doubtless for a similar reason, that the administration of carbonate of ammonia proves so serviceable in scarlatina, that it is held by many to be almost a specific for that disease. Finally, it was the aromatic spt. of ammonia taken steadily for many months which saved the patient in the only case of leukæmia that I have found recorded where recovery took place.

53 SOUTH WASHINGTON SQUARE, Feb. 1st, 1874.

ART. VI.—On the Value of High Powers in the Diagnosis of Blood Stains.

By JOSEPH G. RICHARDSON, M.D., Lecturer on Pathological Anatomy in the University of Pennsylvania, and Microscopist to the Pennsylvania Hospital. (Read before the Biological and Microscopical Section of the Academy of Natural Sciences, and recommended for publication in the American Journal of the Medical Sciences.)

IN the pages of this Journal for July, 1869, appeared an article on the detection, by the microscope, of red and white corpuscles in blood stains, in which I advocated the employment of high powers in such examination, and asserted that by their aid I had been able to demonstrate that the residuum of a dried blood-clot, left after the action of pure water, so long mistaken by Virchow, Robin, and their followers, for "pure fibrin," was composed chiefly of the *cell walls* of the red blood corpuscles, and that by proper management these *capsules* of the red disks could be brought clearly enough into view to enable me to measure them accurately, and so distinguish the dried blood of man from that of an ox, pig, or sheep, with a certainty disputed by Caspar, Wyman, Fleming, and other previous observers.

This possibility of recognizing blood globules when dried *en masse*, is of course closely associated with, if not actually dependent upon, their possession of a cell wall, as maintained in my paper on the cellular structure of the red blood corpuscle, in the *Trans. of the Am. Med. Assoc.* for 1870 (the theory being mainly deduced from experiments upon the gigantic blood disks of the *Menobranhus*, in which crystals of hæmato-crystallin were seen to prop out a visible membranous capsule). Indeed, as I have elsewhere remarked, if the red blood globules are simply homogeneous lumps of jelly-like matter, the chance of discovering any individual corpuscles in a mass of dry blood clot, however moistened, seems almost as hopeless as the search after individual rain drops in a cake of melting ice.

Notwithstanding this, however, we find, in the third edition of Prof. A. S. Taylor's work on Medical Jurisprudence (vol. i. page 548), figures of red blood corpuscles of ten different animals, as they appear under a low power, with the statement (strictly accurate in regard to blood disks thus *feebly* magnified), that "there are no certain methods of distinguishing, microscopically or chemically, the blood of a human being from that of an animal, when it has been once dried on an article of clothing." This declaration seems to show that more complete and conclusive proof is still needed of the superior advantage derivable from the application of high objectives to the diagnosis of blood stains.

The *à priori* arguments against the value of this microscopic test for distinguishing human blood from that of the ox, pig, horse, sheep, and goat, may be grouped under three heads, viz.: 1st. It is objected, as by

Taylor, Caspar, and others, that the difference between the red blood corpuscles of man and of these domestic animals, is too minute to render their positive discrimination possible, and too insignificant to admit of its being used as the means of condemning a fellow creature to death. 2d. That even if the average diameters of these various corpuscles were shown to be so different that we might sometimes by this means distinguish them, yet the variations above and below the mean diameter are so frequent and irregular, that they must render the determination of any such averages by mere micrometric measurement unreliable; and 3d, many investigators believe, with Virchow and Brücke, that no microscopist can "hold himself justified in putting in question a man's life on the uncertain calculation of a blood corpuscle's ratio of contraction by drying."

In reply to the first of these objections, it may be urged, that the blood corpuscles are just as much characteristics of the different kinds of living beings in which they occur, as are the coverings of the body, the shape of the legs, or the number of joints in the antennæ, so that, exactly as we may tell, for example, a bird's skin from an animal's, by the former being covered with feathers, whilst the latter is furnished with hair, so we may distinguish a bird's or a camel's blood from that of a man, by the former having oval corpuscles, whilst those of the latter are rounded in their outline.

Further, in regard to the red blood disks of animals with rounded corpuscles, I can perhaps best illustrate the principles that guide us in their discrimination by suggesting that these bodies may be aptly compared to different sizes of shot. Thus, for instance, the red globules of man's blood are nearly twice the size of the sheep's, and about four times that of the musk deer's, just as No. 1 shot is perhaps double the magnitude of No. 5 and quadruple that of No. 8.

It is obvious, too, that a shot dealer in the latter case, or a skilful microscopist in the former, would more quickly and surely *distinguish* two analogous sizes of red blood, or of leaden *globules*, from each other, than could an inexperienced apprentice in either occupation.

Hence it follows, that whilst we might be in doubt whether the shot dissected out of the body of a wounded man was a No. 1 or a No. 2, we could have no hesitation, after measuring it with a gauge, in declaring it was too large for a No. 5, and *a fortiori* for a No. 8, precisely as the corpuscles of man's blood might be confounded with those of a monkey's, but on measurement are seen at once to be too large for those of an ox or sheep. Nor can it be disputed that *mere measurement* in either instance, when practically correct, is quite sufficient to decide a doubtful case, as, for example, if I was to shoot myself in the hand, and then assert that it had been done by some one else, whose gun was known to be loaded with No. 8 shot, whilst the grains in my flesh were actually of the size of No. 1.

It must be remembered, too, that whilst the relative differences between corpuscles of human, ox, and sheep's blood remain the same, the absolute difference becomes more perceptible in proportion as the disks are magnified above, for example, those represented in Dr. Taylor's work, so that when the former corpuscles appear $\frac{2}{8}$ of an inch and the latter $\frac{5}{8}$ of an inch across (as they do under the $\frac{1}{50}$), they can hardly be mistaken for another, any more than a 12-inch shell could be mistaken for a 6-inch shell, even by a careless person, who would call a No. 1 a No. 5 shot.

Ordinarily in criminal cases the microscopist is called upon to determine, not whether a particular specimen is human, as distinguished from all other kinds of blood, but to discriminate simply between the blood corpuscles of a man and an ox, a man and a horse, or a man and a sheep, and so establish or disprove the defendant's story as to how his clothing or other articles became stained with blood. Sometimes the much easier task is imposed (as in a recent case wherein I was engaged) of diagnosing between the blood of a human being and that of a bird (trial of Charles Larribee for the murder of Lewis Williams, at Franklin, Venango Co., Pa., see *Oil City Daily Derrick*, May 1st, 1874). In this instance many of the suspected stains occurred on the prisoner's boots, and proved upon that article of clothing singularly easy of detection.

Finally, I would remind those, who demur at the idea of allowing a man's life to hang upon such seemingly insignificant circumstances as a difference in size of blood corpuscles, how often the reactions of arsenic, afforded by a quantity of the metal too excessively trivial to be accurately estimated by the most delicate balance, have sufficed to bring out the crime of murder, and to aid in securing that just punishment for violation of law in which we all have so deep an interest, because on it all our enjoyment of life and property depends.

To the second objection, viz., that the variations above and below the standard size of corpuscles, from any particular animal, are too great and irregular to permit us to obtain an accurate result by measurement, I would answer, that this difference in size is more especially observable in corpuscles dried in a thin film upon a glass slide, and is then probably in part a pathological change due to external violence in spreading and drying. These variations are comparatively slight in fresh blood, as is proved by the following experiments, made with my $\frac{1}{50}$ th inch objective, which gives with the micrometer eye-piece an amplification of 3700 diameters. When thus magnified the human red blood disks appear about one inch and one-eighth in diameter, so that even slight differences in their size can be accurately measured. Among one hundred red corpuscles freshly drawn from five different persons, the maximum, minimum, and mean diameters were as follows :—

		Max.	Min.	Means.
Twenty from a white male aged	30	1-3231	1-3500	1-3355
" " " " " "	38	1-3281	1-3529	1-3375
" " " " female "	44	1-3249	1-3500	1-3381
" " " African " "	50	1-3182	1-3559	1-3384
" " " white male " "	8	1-3231	1-3500	1-3398
Average of means				1-3378

The measurement of twenty corpuscles from part of the first of these specimens dried in a thin film upon a slide gave a maximum of $\frac{1}{2800}$, a minimum of $\frac{1}{3521}$, and a mean diameter of $\frac{1}{3182}$ of an inch.

Moreover, if it can be shown that the smallest red discs of man, as usually met with in mechanically unaltered blood, whether dry or moist, are larger than the largest corpuscles of an ox, and *a fortiori* of a sheep, such an objection, as regards these particular animals at least, becomes valueless, and that this is the case I propose to presently demonstrate.

As illustrating the accuracy which some practical experience in measuring minute objects, like the red blood disks, with the cobweb micrometer enables us to attain, I may instance the following fact, which my friend, Prof. Theodore G. Wormley, M.D., of Columbus, Ohio, kindly permits me to mention here, but which may appear more in detail in his appendix on blood stains to the next edition of his splendid work on *Micro-Chemistry of Poisons*. During a recent visit to Philadelphia Prof. Wormley brought with him a slide of human blood, upon which were seven corpuscles (designated by numbers on an accompanying drawing), which he had measured under several different objectives and forms of apparatus. These corpuscles Dr. W. requested me to measure under my $\frac{1}{25}$ immersion lens, and after doing so, I found that my results agreed very closely with his own, and that in two or three instances they were precisely identical. The mean diameter of the seven disks, according to my computation, was $\frac{1}{3268}$ against $\frac{1}{3238}$ of an inch, the average of his measurements. There was thus a total deviation from the true size of only $\frac{1}{3522\frac{1}{2}}$ of an inch in my results, which were those of an independent observer, seeing the objects for the first time, and determining their magnitude under a magnifying power, and by the aid of apparatus entirely different from those Prof. Wormley had employed.

Thirdly, the assertion of Virchow, that a man's life should not be put in question on the uncertain calculation of a blood corpuscle's ratio of contraction by drying, does not seem to me a fair statement of the point at issue; because since the red blood corpuscles of oxen, horses, pigs, sheep, deer, and goats are all much smaller than those of man, no degree of *contraction* which they could undergo would render the stains in which they occur *more* liable to be mistaken for man's blood; and if, as is rarely, if ever, the case, human red blood corpuscles in a stain were by any means contracted so as to resemble those of an ox, for instance, in size, the evi-

dence from microscopic examination would only mislead us into assisting in the acquittal of a criminal, and could not betray us into aiding to convict an innocent person.

Had Prof. Virchow worded his statement so as to read, "the uncertain calculation of a blood corpuscle's ratio of contraction *or expansion* by drying," his objection would have been strictly logical, although, as I believe, it would not have been founded upon fact, because if a corpuscle of ox blood could *expand* during the process of desiccation or of moistening so as to even approximate to the human red disk in magnitude, it might mislead us into testifying erroneously to the presence of man's blood, when beef blood alone had been shed, and thereby endangering the life of an individual who was entirely guiltless.

But my observations, made upon many different kinds of blood, and under a great variety of conditions, clearly indicate that the cell wall of a red blood globule is nearly or quite inelastic, and incapable of any marked expansion by the process of drying or moistening with the fluids I recommend for the examination of blood stains. The slight increase of size mentioned above as occurring in the desiccation of a thin film of blood, forms, I believe, only an apparent exception, and is probably due to a change of shape taking place during the complete flattening out of the disks as they lose their contained water. The experience of Prof. Leidy and Prof. Wormley accords with mine, in that they have never seen the drying or remoistening of red blood corpuscles cause them to expand, and I therefore conclude we may affirm that when the corpuscles remain uncontracted, their indications are perfectly reliable, and if they shrink (as I believe they rarely do), that being the only serious modification which they can undergo, the sole danger is that by a possible, but not probable, mistake in diagnosis of the origin of a blood stain through contraction of its corpuscles, we might contribute to a criminal's escape, *never* to the punishment of an innocent party.

But all these theoretical considerations are of very secondary importance in comparison with the positive fact, as to whether practically we can or cannot discriminate the stains of human blood from those made by the blood of oxen and sheep. I have, therefore, endeavoured to *work out* a conclusive answer to this question, obtaining it by a method which will, I trust, carry conviction to the mind of every honest seeker after truth.

On the 16th of May, 1874, my friends, Prof. J. J. Reese and Dr. S. Weir Mitchell, each kindly prepared for me three packages of dried blood from stains made by sprinkling the fresh fluid from an ox, a man, and a sheep, upon white paper. The two series were simply numbered 1, 2, and 3, and a memorandum preserved by each gentleman, specifying which kind of blood composed each sample. By this plan it is obvious that I was prevented from having any clue to the origin of the specimens save that

afforded by the microscope, and my examinations and measurements were, therefore, entirely free from bias.

Some small particles from specimen No. 1, handed me by Prof. Reese, were broken up into a fine dust, with a sharp knife upon a slide, and covered with a film of thin glass. A few drops of the ordinary three-quarter of one per cent. common salt solution were then successively introduced at one margin of the cover, and removed from the opposite edge, as they penetrated thither, by a little slip of blotting-paper, thus washing away the colouring matter from the tiny masses of dried clot. When these particles were nearly decolourized, a drop of aniline solution was allowed to flow in beneath the cover, and, after remaining about half a minute, was in its turn washed away, and its place supplied by a further portion of weak salt solution.

On adjusting the specimen as thus prepared, under a $\frac{1}{25}$ immersion lens (giving an amplification with the A. eye piece, of 1250 diameters), a fragment of the blood stain was soon discovered, which displayed the delicate cell walls of its component red and white corpuscles, as figured in my *Handbook of Medical Microscopy*, p. 284. Ten consecutive red disks from these, selected simply as among those which had become but little distorted, were found to measure as noted below in the first column. The second and third rows of figures show the result of similar experiments, performed on samples 2 and 3, all the magnitudes being given in parts of an English inch.

Specimen No. 1.	Specimen No. 2.	Specimen No. 3.
1-3448	1-4762	1-5555
1-3572 (minimum)	1-4762	1-6060
1-3572	1-4878 (minimum)	1-5405 (maximum)
1-3572	1-4651	1-5880
1-3333	1-4878	1-6666 (minimum)
1-3125 (maximum)	1-4444 (maximum)	1-6060
1-3448	1-4444	1-5777
1-3278	1-4762	1-5555
1-3333	1-4651	1-5888
1-3448	1-4762	1-5777
<hr/> 1-3407 (mean)	<hr/> 1-4694 (mean)	<hr/> 1-5828 (mean)

Since the red corpuscles of human, ox, and sheep's blood measure, according to Gulliver, $\frac{1}{3200}$, $\frac{1}{4267}$, and $\frac{1}{5300}$ of an inch respectively, and previous experiments of my own had demonstrated a disposition to *slight* contraction in the corpuscles of blood stains which have been dried and moistened again, I of course concluded that sample No. 1 was human blood, No. 2 was ox blood, and No. 3 was sheep's blood. On reporting these diagnoses to Prof. Reese, I had the satisfaction of learning that they were "entirely correct."

Careful examination of the three specimens furnished me by Dr. Mitchell, and prepared in a manner similar to that detailed above (except that

diluted liq. iodinii comp. was used instead of aniline liquid for tinting the cellular elements), led me to analogous conclusions, as will be seen from the following table of measurements :—

Specimen No. 1.	Specimen No. 2.	Specimen No. 3.
1-4545	1-6250	1-3572
1-4762	1-6250	1-3390
1-4878 (minimum)	1-6060	1-3175 (maximum)
1-4347 (maximum)	1-6450 (minimum)	1-3278
1-4444	1-5880	1-3448
1-4762	1-5777	1-3333
1-4651	1-5555	1-3572
1-4878	1-5405 (maximum)	1-3390
1-4545	1-6250	1-3572 (minimum)
1-4878	1-5880	1-3636
1-4662 (mean)	1-5952 (mean)	1-3430 (mean)

From these results, I of course decided that No. 1 was ox blood, No. 2 was sheep's blood, and No. 3 was human blood, and on reporting my conclusions to Dr. Mitchell, I was again very much gratified to receive a reply informing me that they were perfectly correct.

It is interesting and important to observe, that in no instance do the minimum diameters of the human blood corpuscles closely approach the maximum diameter of even those from ox blood. It is true that corpuscles are occasionally to be met with both in fresh blood and in dried clot, which fall much below the general average of the specimen, but these are comparatively rare (not amounting to over one in a hundred), and they so generally in fresh blood bear such marks of traumatic injury or pathological change, that it is only fair to disregard them in making up our estimates. If my views are correct respecting the osmotic processes constantly going on through the cell wall of both the red and the white corpuscles (*vide* Report on the Structure of the White Blood Corpuscle, *Trans. of Am. Med. Assoc.*, 1872, p. 178), alterations in the specific gravity of the liquor sanguinis, surrounding the corpuscles, produced by desiccation at the margin of the thin glass cover, must cause slight changes in the diameter of the disks. Nevertheless, as these variations necessarily lie between their normal size ($\frac{1}{3378}$?), and their magnitude when dried upon a slide ($\frac{1}{3182}$?), they can never lead to confusion in diagnosis even from ox blood.

In regard to the practical minutiae of the examination of blood stains, I have little to add to the description given a page or two back, except concerning the menstrua advised by various authors.

The saturated solution of sulphate of soda recommended by Prof. Charles Robin, and endorsed by numerous authorities, has the disadvantage of rapidly crystallizing around the specimen, and must, I think, owe its popularity chiefly to the fact that it often contains large quantities of a peculiar

fungus, the spores of which closely resemble red blood corpuscles both in size and general appearance, and have, I doubt not, frequently been mistaken for blood cells. Diluted albumen and solution of hypophosphite of soda have not in my hands seemed to possess any peculiar advantages, and the method of Erpenbeck, quoted by Prof. Taylor, of gently breathing on the fragments of blood clot until they are sufficiently moistened to liquefy, will not, I believe, in general enable us to demonstrate any corpuscles except the leucocytes of the coagulum. These leucocytes have probably often been mistaken by observers for "decolourized red disks."

The highly refractive properties of glycerin and its solutions advised by Dr. Taylor and others, render it in my judgment less applicable as a liquid for moistening blood stains and bringing into view the delicate cell walls of their constituent corpuscles than the 75 per cent. salt solution. I can, however, fully agree with my friend, Dr. R. M. Bertolet, that for preservation and prolonged study of specimens of blood stains, glycerin forms the best medium at our disposal, although it seems to me that his suggestion, that we should before mounting them tint the cell walls and nuclei of oviparous blood corpuscles with the reagents employed in the admirable guaiacum test for blood, will be found in practice less advantageous than my own plan of using aniline solution. And this in part on account of the difficulty of procuring the ethereal proportion of peroxide of hydrogen, and of applying it to microscopic specimens, and partly because it will prove so much harder to convince the average juryman that a bright blue material (instead of a crimson-red substance) is actually clotted blood.

In examining spots of blood more than one-tenth of an inch in diameter, I would advise that fragments should be scraped from the edges or thinnest parts of the stain, because specimens from the central portions sometimes exhibit numerous fibrin filaments, which have appeared before the desiccation of the drop. These of course interfere with the investigation, by forming a more or less complete meshwork around the cell walls, and so confusing the delicate outlines which the latter present when the view is uninterrupted.

As a contribution towards answering the question of how long after their deposit upon objects blood stains may be detected by microscopic investigation, I may mention that a fragment from one of the twenty blood spots used in May 1869, "for estimating the delicacy of the microscopic test for blood" (determined at $\frac{1}{12000}$ of a grain, as stated in my paper in vol. 58, N. S., of this Journal, p. 57) was recently examined as above described, and found still at the end of *five years* to exhibit multitudes of corpuscles, which could be clearly distinguished from those of the ox or sheep, as will be seen by the following record of measurements made May 23, 1874 :—

1-3572	of an inch.	
1-3448	" "	
1-3278	" "	
1-3125	" "	maximum.
1-3390	" "	
1-3509	" "	
1-3448	" "	
1-3509	" "	
1-3572	" "	minimum.
1-3448	" "	
<hr/>		
1-3425	" "	mean of ten corpuscles.

The corresponding average of my measurements five years ago was $\frac{1}{3474}$ of an inch, so that no further contraction seems to result from age, and as the outlines of the corpuscles appear quite as distinct now as they did soon after the blood was drawn, it seems probable that this microscopic evidence of human bloodshed will be equally unmistakable twenty or even fifty years hence, provided due care continues to be exercised in its preservation from moisture and external violence.

In conclusion, I submit, that the results of my experiments above narrated *prove, that*, since the red blood globules of the pig ($\frac{1}{4230}$), the ox ($\frac{1}{4267}$), the red deer ($\frac{1}{4324}$), the cat ($\frac{1}{4404}$), the horse ($\frac{1}{4600}$), the sheep ($\frac{1}{5300}$), and the goat ($\frac{1}{6388}$ of an inch), are all so much smaller than even the ordinary minimum size of the human red disk, as measured in my investigations, *we are now able, by the aid of high powers of the microscope*, and under favourable circumstances, to positively distinguish stains produced by human blood from those caused by the blood of any of the animals just enumerated, and this even after the lapse of five years from the date of their primary production.

No. 1620 CHESTNUT STREET, PHILADELPHIA.

ART. VII.—*On Transfusion of Blood, with a Report of Eight Cases, and a Description of a Convenient Apparatus for Performing the Mediate Method.* By THOMAS G. MORTON, M.D., one of the Attending Surgeons of the Pennsylvania Hospital; Emeritus Surgeon to Wills (Ophthalmic) Hospital, Philadelphia. (With three wood-cuts.)

TRANSFUSION of blood may be so readily performed, and with such entire safety, that it is somewhat surprising that this recognized life-saving operation has not been resorted to more frequently.

Transfusion seems especially indicated where death is imminent from hemorrhage; while in the slow convalescence after fevers, in anæmia, and in diseases accompanied by excessive drain, or in cases of blood poisoning,

this operation, by introducing a vigorous healthy element directly into the circulation, would seem particularly applicable.

In transfusion the surgeon has the choice between the immediate and the mediate methods; in the former arterial or venous blood is conducted direct from an artery or a vein in the donor into a vein of the receiver. In the mediate method the blood of the donor is defibrinated, strained, and then injected.

I am not aware that the immediate operation has ever been performed in this city, while the transfusion of defibrinated blood has been very successfully done a number of times.

In the immediate method small clots of blood it is supposed are liable to form in the connecting rubber tubing between the donor and the receiver, and these if injected would doubtless produce serious results; venous blood is also generally transfused, since arteriotomy is seldom if ever recommended.

Immediate transfusion from the radial artery, as has been suggested, would answer admirably for the receiver, but donors of blood, although they might be willing to submit to venesection, would hardly allow the opening of a main artery.

Having used defibrinated blood now in four cases with such perfectly satisfactory results, I see no reason to relinquish this plan in favour of the immediate method.

1st. There is no danger from the formation of clots, or from the introduction of air.

2d. The donor's blood, which is venous when drawn, is partially oxygenized by its exposure during defibrination.

3d. The amount injected is readily measured.

4th. The avoidance of all haste in the operation.

5th. Drawing the blood and its defibrination need not be conducted before the patient.

Dr. J. G. Allen has furnished me with a report of his four operations, with a note respecting my first case at the Pennsylvania Hospital, one of impending dissolution from hemorrhage, when I had Dr. Allen's assistance, who had twice successfully performed transfusion.

The apparatus we then used was not altogether satisfactory; it was simply a tin receiver, in which the blood was collected and defibrinated, a syringe and canula attached.

Mr. Kolbé afterwards made, at my suggestion, a more compact set of instruments, consisting of a receiver which was suggested by Dr. Allen, and so arranged that the blood is constantly surrounded by warm water, to this was added a thermometer; a glass syringe, and blunt canulas, lancets, and an extra thermometer complete the case.

Description of Instruments.—The receiver is a cylindrical vessel, made of German silver, six inches in diameter, and six inches in height, having

at its upper and outer edge a short half-inch metal tube, closed by a screw cap through which water is introduced into the water-tight chamber ; on the outside is a thermometer, the curved bulb of which lies in the chamber, and by which the temperature of the water is regulated. In the interior is an inverted cone gilded on the exposed surface, into which the blood is drawn ; this cone is joined to the outer vessel at the top ; a broad lip is attached to the upper part of the receiver, extending about one-third of the way around. (See Figs. 1, 2.)

Fig. 1.

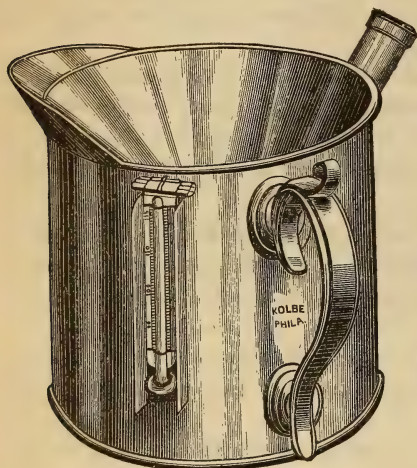


Fig. 2.

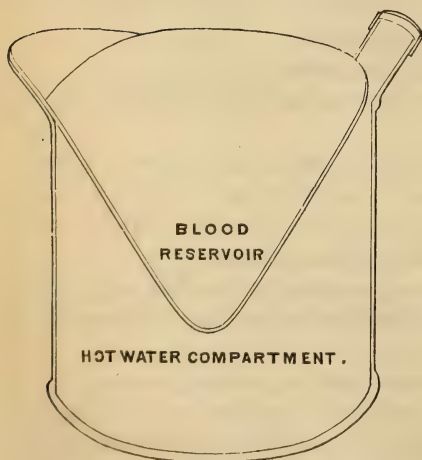
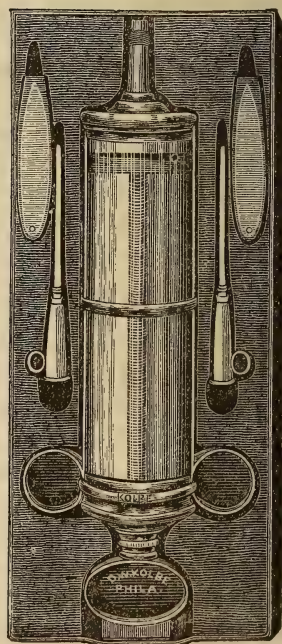


Fig. 3.



The syringe is of glass, five inches long by one inch in width, metal bound with hard rubber at each end, holding two ounces, with a tapering rubber nozzle one and a half inches in length. The canulas are blunt steel tubes, two inches long and one-twentieth of an inch in diameter, to which

is attached a conical metal neck, into which the tapering extremity of the syringe accurately fits. (See Fig. 3.) An ordinary thumb lancet or two completes the case. Besides these instruments a tumbler or bowl, surrounded by hot water at the time of operation, to receive the blood while it is being strained, and some fine linen will be required. Two or three whisks, six inches long by an inch thick, should be at hand, simply tied together in the middle so that both ends may be made available; these are quickly made from a common clothes whisk or broom.

Method of Defibrination.—The hot water compartment (Fig. 2) is filled through the tube with water at a temperature of from 110° to 112° , which can be regulated by the thermometer. The blood drawn from the donor is collected in the receiver and constantly kept stirred with a whisk, upon which the fibrin quickly collects. Should one whisk become choked another may be substituted. The blood, when defibrinated, is then strained through some fine clean linen into a tumbler or bowl surrounded by water at the temperature before indicated. While the straining is progressing, which occupies a minute or two, the receiver is carefully washed out, and the strained blood poured back and is now ready for injection.

Operation.—Either the median cephalic or the median basilic vein, or in young subjects the saphena just above the ankle, should be exposed and opened by an incision on a line with the vessel; a blunt canula is then inserted and held in place by the finger of an assistant; should the distal end of the vein bleed, it is readily controlled either by pressure or an acupressure pin. The syringe is immersed for a moment in hot water, and then *not quite* filled with the defibrinated blood; the nozzle is then placed in the canula, and the piston being then drawn out to its full extent, any particles of air which may have been in the canula or tube are sucked out, and with a slight elevation of the syringe, pass through the contents of the syringe to the top.

The blood is then slowly and steadily thrown into the patient, and the operation repeated until the desired amount has been injected. During transfusion, except in one instance, I have not observed any marked change either in respiration or the circulation. In the case alluded to, at the close of the operation the patient, who was at the time unconscious, showed an oppressed state of breathing, which looked serious, but soon vanished on opening the windows. Dr. Allen thought at the time this might have been due to the entrance of some bubbles of air.

The largest amount of blood which I have transfused was eleven ounces, the smallest quantity two ounces; in this case the small amount injected was found quite sufficient to stimulate the heart to active contraction, when all the symptoms indicated that life was on the verge of extinction.

In this instance, a child of eleven years of age, I had very great difficulty in finding the vein in the arm, the vessels being exceedingly small, and quite collapsed, so that a somewhat tedious dissection was necessary.

Defibrination is objected to on the ground that a large quantity of the red globules are unavoidably removed with the fibrin; this I am inclined to

believe is not so much as supposed, for I have found the fibrin collect at the end of the whisk with apparently very few of the globules.

I do not apprehend, nor have I known of any trouble arising from opening a vein, which has been suggested, and to avoid this the use of the sharp aspirator like needle has been recommended

I tried in two of my transfusions thus to introduce the sharp needle, wishing to avoid exposing the vein, but had to abandon the attempt in both instances; the vessels were collapsed, and the injection could not be made to pass, as the needle point invariably and unavoidably punctured the opposite wall of the vein.

It has also been stated as an argument in favour of immediate transfusion that clots are not liable to form in the connecting tube, that "as the fluid is drawn into a vacuum, there is no danger of coagula forming."¹ While "coagulation is accelerated by exposure to air, it is not prevented by complete exclusion from it, as is proved by its taking place in a vacuum,"² and any one who has ever used the artificial leech may have observed, that coagula form almost at once in the exhausting syringe, which is essentially in vacuo.

The question of loss of time in performing the various steps incident to defibrination has also been urged against the mediate method; but I believe that the defibrinating process may be completed almost if not quite as quickly as any apparatus for the immediate transfusion can be arranged.

CASE I. Lacerated wound of face and upper jaw; hemorrhagic diathesis; continued hemorrhage; ligation of the common carotid artery; transfusion; death from rupture of jugular vein.—On the 15th of October, 1869, W. P., aged 27, was admitted into the Pennsylvania Hospital on account of continued hemorrhage from a severe laceration of the upper lip and jaw. Eight days before admission he fell down stairs while carrying a pitcher; a fragment of the broken china penetrated deeply the inner surface of the upper lip a little to the left of the median line, producing a very deep irregular ugly wound. When admitted he was exceedingly weak from the loss of blood; his mouth was full of clots which were washed out, and plugs of lint saturated with the persulphate of iron inserted; hemorrhage again took place two hours afterwards, which was only stopped by the direct application of a compress and roller placed on each side of the nose. At 5 P. M. hemorrhage again occurred, and a long accupressure needle was passed entirely through the upper lip and a silk ligature thrown tightly over it. Till the morning of the 19th no more hemorrhage took place. It then recurred, and both facials were compressed by needles upon the lower jaw, which, however, did not check the flow of blood. 7 P. M. After consultation with Dr. Wm. Hunt, ligation of the external carotid was decided upon; but, finding this impracticable, the ligature was placed on the main vessel, the patient being nearly exsanguine and totally unconscious. Slight oozing from the wound continued.

20th. The patient, although not having lost much since the operation,

¹ New York Med. Record, March 30, 1874. Rowe on Transfusion.

² Carpenter's Phys., Am. ed., p. 210.

was in a comatose condition and appeared to be dying. With Dr. Allen's assistance and direction, transfusion was performed by the mediate method at 4 P. M., assisted by Dr. Hunt, and Dr. Hunter the resident physician, in the presence of a number of medical gentlemen; Drs. W. C. Cox and Haines, then students of medicine, gave the desired amount of blood. Eleven ounces of defibrinated blood were transfused; a marked rigor followed the operation. In two hours afterwards the patient was semi-conscious.

21st. The lips had a better colour, and he was perfectly rational and able to sit up in bed, and without any further hemorrhage.

26th. He was walking about the ward and was presented to the medical class. He continued to improve till November 3d, when the internal jugular vein gave way, causing death on the 5th of the same month. The operation of transfusion prolonged the life of the patient over two weeks.

CASE II. *Suspected carcinoma of the stomach; marked leucocythemic symptoms with great prostration; transfusion; relief; death four months afterwards from cancer.*—I was consulted in August, 1870, by Mr. C. K., a German gentleman, aged 45, who had been suffering for a long time with gastric derangement, his symptoms having gradually assumed a rather severe character with marked jaundice and dysenteric symptoms. The patient had an excellent physique, with formerly a fine florid complexion, of late a sallow waxy hue; his weight was usually 180 pounds, but during the preceding month or two he had lost considerably; food was rather disgusting to him, and what little he took produced much discomfort; scarcely a day passed without one or more attacks of vomiting; a considerable quantity of disorganized blood was frequently mixed with the matter ejected. He had been a very free liver; used to late suppers, and had for years drank to excess. A careful examination failed to detect any abdominal tenderness or tumour, and an analysis of the urine was made by Dr. J. G. Richardson, disclosing no renal trouble. The patient was placed upon the "milk cure" for three weeks; this was followed by a very carefully regulated diet with nutritious injections. A trip to the mountains was also very beneficial, and produced marked improvement. At the close of September the old symptoms, vomiting and distress, returned, and day after day he gradually became weaker and was soon confined to bed. Champagne and beef-tea were prescribed, and the nutritious enemata were given every four hours with good results. The bloodless appearance of the patient and the absence of any abdominal tumour, with slight tendency to œdema of the hands and feet, gave rise to the idea that possibly the affection might be simply leucocythemia; the skin, mucous membrane of the mouth, and gums presented an absolutely blanched appearance; in fact, the patient looked as if he did not possess a globule of red blood; although able to retain a considerable part of the nourishment taken, yet no portion of it seemed to be assimilated, and from the excessive prostration, death seemed inevitable at an early period. Drs. J. F. Meigs and Mitchell saw the patient on several occasions in consultation. In November, death appearing imminent, transfusion was suggested to the patient, and the operation immediately agreed upon; for should the disease be cancer, life would likely be prolonged, and if his disease should prove simply an inability of the digestive organs to assimilate, a favourable change might be induced by transfusion. Accordingly the operation was performed as previously described, November 12, 1870, with the assistance of Drs. Mitchell, Hunt, Brinton, and others. The donor of the blood was a nephew of the patient, a stout, vigorous

young man ; rather more than six ounces of defibrinated blood were injected into the median basilic vein of the left arm. The syringe was filled three times, and no unpleasant symptom was observed, either in the respiration or circulation, during or after the operation.

The gums and lips of the patient, which had an absolutely blanched appearance, quickly assumed a decided tint which gradually deepened. A comfortable night was passed, and on the following day there was a marked change for the better ; his strength and spirits revived, and a very decided improvement in all respects was observed.

The nutritious enemata were continued, with champagne and broths by mouth.

Two months after the transfusion his health began to fail rapidly, with constant sick stomach, great and rapid emaciation, and death occurred March 23, 1871. At the post-mortem examination very extensive carcinomatous ulceration was found to involve the *upper* surface of the stomach, and especially the cardiac extremity ; the pylorus was free from the disease.

In this case the transfusion gave temporarily a new lease of life ; for the patient could not have long survived the terribly prostrated condition he was in at the time of the operation.

I attempted here to introduce the sharp needle without exposing the vein, but found it impossible, from the collapsed state of the vessel.

CASE III. Hæmorrhœa petechialis ; repeated epistaxis, associated with alveolar hemorrhage ; almost fatal prostration ; transfusion twice performed at intervals of six weeks, with recovery.—Ida H., aged 11, a slender girl, in apparently good health, was suddenly seized, September, 1871, with copious bleeding from the left nostril and bladder ; at the same time her entire body presented the characteristic petechia purpura, minute spots appearing over the entire body, with large ecchymoses on the limbs an inch to an inch and a half in diameter.

The child was so much reduced by the loss of blood that for nine months she was confined to her bed, and during this period scarcely a day passed without some bleeding ; gradually she regained her strength. In September, 1872, she had a severe recurrence of the hemorrhage which nearly proved fatal ; the nasal bleeding was controlled by injections of persulphate of iron and plugging the nose. As in the first attack, the body was entirely covered with ecchymotic spots ; the extravasations of blood on the front of the legs were of enormous size. On Feb. 2, 1874, the third attack was ushered in by hæmorrhœa petechialis followed by continued nasal hemorrhage ; the child was drenched with blood and exceedingly prostrated ; the use of alum water with plugging the nostrils controlled the flow, and under iron, champagne, beef-tea, and punch improvement followed. February 8, the spots appeared again and hemorrhage occurred, and before relief could be obtained, the bleeding was so profuse that the child was almost exsanguine ; the blood found its way back as well as front, and had been vomited in large quantities ; no pulse could be felt at the wrists, and her extremities were cold, and death seemed imminent. Large blue patches of effused blood appeared under the skin especially on the limbs, and her entire body was covered with the smaller purpuric spots.

Transfusion was proposed and immediately agreed upon, and performed with the aid of Dr. Wm. C. Cox, at 12.30 P. M. ; the uncle of the child gave the blood, which was defibrinated. The median cephalic vein in the left arm of the child was opened after much difficulty, on account of the very small size and collapsed condition of the vessel, which could not be

found until after considerable dissection. A blunt cannula was then introduced and two ounces of blood were injected; no unpleasant symptom was experienced by the patient during the procedure; the pulse, which was imperceptible prior to the transfusion, could now be counted; a comfortable night was passed; pulse 136.

February 12. A slight appearance of blood from the nose, but stopped without treatment; pulse 94; temp. 98°. Beef-tea and champagne were continued.

13th. Patient up, and doing well.

14th. The child was out driving, and was very comfortable and quite strong, with digestive organs in good condition. She continued apparently well until the afternoon of the 29th of March, when hemorrhage came on from the gum of the lower jaw, where one of the first teeth had fallen out. Towards evening the ecchymosed patches and purpuric spots again announced a serious condition, and severe nasal hemorrhage occurred. I did not see the child until 11 P. M., and then found her almost bloodless and without pulse, bathed in cold perspiration, and in a dying state. With Dr. Cox's assistance I again performed transfusion; the aunt of the child, a stout lady of 35 years of age, was the donor of the blood; defibrination, as previously described, was effected in a very few moments. Having so much difficulty with the vein in the arm previously, I selected the saphena vein of the right leg just above the ankle, which was laid bare, and a pin passed under its distal end and compressed by a silk ligature. Six ounces were satisfactorily injected, and with immediate good effect. Two grains of quinia with stimulants and opiates were administered, five grains of protocarb. iron were ordered three times a day; some milk-punch, beef-tea, etc., and at the end of a week the emulsion of cod-liver oil with lactophosphate of lime was added.

April 7. Doing well, up, going about as usual, excellent pulse, no appearance of having lately suffered the loss of so much blood.

May 26th. Is in perfect health.

The rapid improvement and recovery following each transfusion, presents a marked contrast with the tardy convalescence, with confinement to bed during nine months, which followed the first hemorrhage, in 1871; while the transfusion, which was performed twice in this patient, is rendered more interesting from the fact of the subject being so young.

The following notes of cases have been obligingly communicated to me by Dr. J. G. ALLEN.

CASE I. Was that of a patient of Dr. Wm. Carroll, December 30, 1868; a Mrs. P., residing in Dock Street. She was suffering from hydræmia consequent upon long-continued and repeated uterine hemorrhages in connection with a stubborn though mild type of intermittent malarial fever. She had not improved in the least under long-continued previous tonic treatment, which had been carefully carried out, in connection with some local treatment of the uterus, which was patulous and spongy, the os being studded over with a few pale granulations. She was scarcely able to move in her bed from weakness, at the time of the operation. At least six ounces (6 oz.) of defibrinated blood were injected. The patient soon after rallied and regained a very satisfactory degree of health. About eighteen months afterward she became pregnant and aborted at fourth or fifth month. Meanwhile had ceased to employ Dr. Carroll and fell into the hands of a very unskilful practitioner, and died from hemorrhage connected with this miscarriage.

CASE II. Occurred in a member of the medical profession, suffering from purpura hemorrhagica; he was about twenty-six years of age, and I believe of

phthisical inheritance, and had a marked so-called scrofulous diathesis. In early life had suffered from repeated abscess and ulceration of the neck involving the cervical glands; had been frequently the victim of obstinate epistaxis.

For a few days previous to the operation he had been bleeding from the posterior nares, to stop which all efforts were unavailing. After a time the blood began to ooze freely and rather rapidly from the gums and almost all portions of the mucous surface of the mouth. The blood seemed wholly disorganized, and the patient was in the most deplorable condition, literally at death's door. About seven or eight ounces of defibrinated blood were injected, and in six or eight hours after the operation the blood which had been oozing from the patient's mouth and nose began to coagulate, and finally ceased to flow. No one had expected the man to live twelve hours at the time of the operation, the immediate effect of which was undoubtedly beneficial, as the patient revived and lived I think more than a month afterward; the hemorrhages, however, recurred, and the patient finally succumbed to the continued losses of blood and inherited vice of constitution.

Dr. Carroll assisted at the first operation, and Dr. Hoehling of the Navy assisted me at both, and has reported the cases.¹ Dr. H. errs, however, as to the quantity of blood injected. I have since measured the syringe used, and found it to hold more than we at the time estimated. The case first reported I believe to be the first successful instance of transfusion in America and the first attempt by Mader's method.

CASE III. Was a patient of your own in the wards of the Pennsylvania Hospital. I allude to the case of wound of the upper lip from falling upon a fragment of broken pitcher which the patient was carrying.

One point I desire specially to call your attention to in this case: the patient, as you know, was extremely prostrated at the time of the operation; he was upon a low and inconvenient hospital bed, and we were excessively crowded by a great number of medical gentlemen and students who witnessed the operation. You will remember we accidentally passed into his vein two or three little bubbles of air not larger than a pea, a kind of froth which had collected upon the blood in the syringe, this was, after the operation, followed by, and the probable cause of, the fit of gasping and threatened syncope which lasted about a half minute, and which was at the time attributed to want of air from many persons crowding over the bed.

CASE IV. Was another patient at the Pennsylvania Hospital under the care of Drs. Agnew and Hewson. The man was of very intemperate habits, and while drunk had fallen off a street car on the third day of July, 1869, and had his leg crushed under the car wheel.

At the time of the operation, he was in a collapsed condition; reaction, however, took place, and the leg was amputated ten or twelve hours after. This patient did not recover. Death occurred July 19th.

CASE V. Was a patient of Dr. ———. Hemorrhage from bowels; it occurred some time during the summer of 1869. Prof. Gross was in consultation.

The patient died a few hours after the operation. In both these latter cases there had been excessive hemorrhage, and the venous system was utterly collapsed, causing very great difficulty in getting the canula into the vein, so that the operation was in neither case very satisfactorily performed.

After the experience of the first two operations I invented the bowl for the reception of the blood and keeping it warm.

¹ Medical and Surgical Reporter, May 15, 1869.

ART. VIII.—*Case of Mollities Ossium.* By JOHN NEILL, M.D., Associate Professor of Clinical Surgery in the Hospital of the University of Pennsylvania.

So few instances of this disease have occurred in this country that I think it a duty to place upon record the following case, and at the same time to notice a few others which have been recorded elsewhere.

Mr. B., a merchant of Philadelphia, was born in Virginia, of healthy parents, one of whom died from yellow fever, and the other from ———. He was a tall, spare-built man, and although not robust, never had any disease of sufficient consequence to confine him to the house, except an attack of pneumonia of the right lung, six or eight years previously to his last illness, from which he recovered without any remaining complications. His habits were active and regular.

In the summer of 1869, he was seized with a pain in his right thigh, which was supposed to be rheumatism; and although there was very decided swelling of the ankle-joint, it did not confine him to the house, until December, when he suffered so much, that he went out but occasionally; after February, 1870, he was confined to his bed. He suffered from severe, deep-seated pain in the middle of the thigh, and the swelling of the ankle continued. He became thinner and weaker, although his appetite was not merely good, but voracious. His food seemed not to inconvenience his digestive apparatus, although but little of it was appropriated. He suffered to some extent from retention of urine, and about the last of July his suffering became very severe, and his attention was suddenly attracted to a prominence upon his thigh, which had occurred in the night.

At this period he came under my care, and I obtained this previous history from others, and not from my own observations. Upon examination of the limb, the deformity was so striking and marked, that it could not well be mistaken; the thigh was bent in the middle, almost to a right angle; the skin was very hot to the touch, and of a dusky-red appearance. Through the integuments and muscles, the bone could be felt, and there was evidently an increase of diameter at the bent portion. The foot, ankle, and lower half of the leg were œdematous, and he referred much of his pain to the ankle. The other limb was extremely emaciated, and indeed his whole body resembled that of a person in advanced and prolonged phthisis. His appetite was still good, in fact, craving; he had great zest in eating and drinking, but his digestion was impaired, and his food, instead of nourishing him, seemed only to act as an irritant to his bowels. Diarrhœa became profuse even when his diet was most carefully regulated, and medicine had very little control over it. His discharges were not only frequent, but of a most unusually offensive character.

The treatment, which consisted of nourishment, opiates, and tonics, had little or no effect, and he died September 26, 1870.

The *post-mortem examination* was permitted, on a promise of restricting the inspection to the diseased limb only. Upon removing the soft parts, which were there expanded, the periosteum over the diseased portions was thickened and of a deeper colour. The bone was one and three-quarters of an inch thick at the bend, and this thickness gradually diminished up and down the shaft towards the epiphyses. In the handling

to which the limb was subjected, there was no flexibility. With an ordinary large scalpel, making firm pressure, I made two semi-elliptical incisions, approaching each other through the bone, longitudinally, and deep enough to reach the medullary canal; the knife went through easily, yet the tissue had some firmness, especially under the periosteum.

Upon an examination of this section, the solid, dense, laminated structure of the shaft of the bone was entirely gone, and in its place had been elaborated a cancellated spongy structure containing oil and bloody serum. The thin edge of this section was flexible, tough, and elastic. After the piece had been washed, the walls were observed to be thinner as they approached the medullary canal, and they were semi-transparent, of a yellowish-brown colour, cartilaginous, but tougher and harder to the touch than the cut extremity of a femur which had been softened in muriatic acid for the purpose of exhibiting the animal matter of bone.

The medullary canal was filled with the same material as the cancelli, a thick, dark coloured, reddish, semi-fluid pulp.

We have been able to discover but two cases of this disease which had occurred in this country, and we present an analysis of the striking features of them.

Dr. Tenny, of Webster, Mass., records in the No. of this Journal for October, 1839, p. 506, a case of a woman 43 years of age, and the mother of five children, who died after two years' illness. At first she manifested general weakness especially in her lower limbs, producing an alteration in her gait. The slightest impediment threw her down; her appetite continued good, and her stomach retained and digested food; she became unable to support her weight, and was confined to bed when her thigh-bone was found flexed at a right angle near the centre. The patient was not sensible of it until it was accidentally discovered, and supposed to be broken; but the extreme emaciation showed that the limb was bent spontaneously, and that the bones were in the same condition.

Autopsy.—Edema of the lower extremities; upon cutting down upon the bone it was found to have been doubled over on itself in such a manner that without altering the general direction of the limb, it had shortened it about two inches, besides which there was a rectangular deformity. The bone was so soft as to be easily pierced by a scalpel. The medulla was disorganized, and the cavity appeared to be filled by a clot of blood. Immediately beneath the periosteum the bone was firmer than elsewhere, though it could be crushed between the fingers.

Dr. Jones, of New Orleans, records (*Trans. Am. Med. Assoc.*, vol. xx. 1869) a case of a young woman eighteen years of age, of humble life, being in great poverty, and supported by alms in a hovel. The father and mother were unhealthy, pale, and cadaverous, and for a long time had been the victims of malaria. The softening of the bones commenced in the leg after an attack of ague. The left humerus lost all its earthy matter for the space of five inches, and she suffered great pain; the upper and lower end seemed to be bony, but the intervening part had been converted into a flexible cartilaginous mass; the arm could be bent at right angles; the right humerus was rough and enlarged, and painful to the touch, and the right radius was apparently destroyed; the left tibia and fibula were divided or absorbed; and her mother states that this leg "was fractured at night with an audible snap." Although eighteen years of age, she was only three feet nine inches high, and weighed not more than a child four years of age.

It is believed that these are the only cases recorded as such in American journals, and in addition we give a condensed account of several others, which have been reported very fully in Dr. Jones's excellent paper.

Mr. Sylvanus Bevan, F.R.S. (*Philos. Trans.*, vol. xlii. No. 470), states that a woman in 1738 was seized with diabetes, and after eighteen months of fever and wasting and pain, was obliged to go to bed. The bones in her arms and legs became soft to the touch, and could be bent in a curve, and finally became as limber as a rag.

Post-mortem examination.—The outer laminæ of the bones were soft and membranous, containing, instead of a bony substance, a thick fluid of reddish colour. There was no appearance of bones in her legs and arms except near the joints, but what remained was soft and full of holes like a honey-comb. Those parts of the bones that were most compact and hard were dissolved first, whilst their heads, which were more spongy and soft, had not so entirely lost their substance.

Ambrose Hosty, M.D., reports (*Philos. Trans.*, vol. xlviii.) the case of Ann Elizabeth Queriot in 1753. She was 35 years of age, married, and confined three times. After her last labour she was seized with pain in her limbs, and became bed-ridden and distorted; all the bones were affected. The lower extremities turned upward, and became parallel with her body. This state was attended with exquisite pain.

Post-mortem.—Upon cutting in the left tibia some parts were entirely dissolved, and the sides were not thicker than the gristle of the ear. Instead of the marrow, a thick red matter like coagulated blood mixed with grease was found in all the bones.

John Pringle, M.D., F.R.S., reports the case (*Philos. Trans.*, 1753, vol. xlviii.) of Mary Hayes, who heard her bone snap while walking, after which the bones of the legs and thighs grew flexible. Her spine became distorted; she was confined to her bed, wasted and died, and her body was two feet shorter than when living.

Post-mortem examination.—All the bones were more or less affected, and scarcely any would resist the knife. They were so soft that they were cut through without using the edge of the knife. Those bones were most dissolved which were in the natural state most compact, and contained most marrow in their cavities, and the heads of them were the last portions dissolved. The interior was filled with a dark, pulpy, parenchymatous substance like soft dark-coloured liver.

Thomas K. Chambers, M.D., reports (*Lancet*, March 25, 1854) the case of a young woman who had a spontaneous fracture, first of one thigh and then of the other, in St. George's Hospital. She suffered great pain in both arms, which became paralyzed. The pelvis and ribs fell in, and she died in a year. The bones throughout the system were found soft and unresisting; a sharp knife could readily pass through them. A section of the tibia was of the colour of muscle, its shape being retained by the periosteum. "The microscope exhibited the bone as consisting of large fat vesicles, some containing a white and some a reddish oil. The parts next the periosteum, which felt gritty, presented, when examined under a quarter-inch object-glass, some islands of opaque bone, the bone corpuscles being indistinct and the canaliculi not to be discovered.

Mr. S. Solly reports two cases, the first (*Med.-Chir. Trans.*, vol. xxvii.) being that of a young woman whose health began to decline at nineteen, and whose bones fractured easily, and whose spine became distorted. She suffered great pain. Her head became enlarged, and her mind became affected. She was unable to stand, and had to push herself from place to place. She became much emaciated, and suffered excruciating pains in her bones. Her appetite was good. She was twenty-nine when she died.

Post-mortem examination.—A longitudinal section of the long bones showed that the osseous structure of the bone was nearly absorbed, a mere shell being left. The interior was filled with a dark grumous matter, varying in colour from that of dark blood to light-reddish liver-colour. The Haversian canals were enormously dilated, and the osseous corpuscles diminished in quantity. The joints were all healthy.

The second case (*Med.-Chir. Review*, April, 1845) was Sarah Newbury, 39 years of age; married for nine years, no children. Was robust until she had an attack of rheumatism, when she fell, and was subsequently confined to her room.

She suffered great pain in her bones, and was hardly able to walk. When her husband was carrying her, her thighs were suddenly drawn up. The spine became curved, the clavicles, which had been previously fractured, were now bent. Both thighs were broken, the left twisted inward and the right bent at an acute angle in the centre. Subsequently the right foot was completely drawn over her head, in the same position as is represented in the case of Madame Supiot, *née* Quenot. She died after eight years' sickness.

The *post-mortem* was very carefully performed, and numerous sections were made of all the bones which were generally diseased. But that of the right thigh was the most characteristic. The whole of the osseous matter had been removed, and in the centre nothing but periosteum and membranous matter left. Towards the condyles the bone was nearly of its natural colour. In the lower third the red matter was abundant, exhibiting various hues. The red matter was carefully examined by Mr. Birkett of Guy's, and Mr. Rainey of St. Thomas's Hospital, as well as by Mr. Simon of King's College.

The reader might here say that the reproducing of these cases, with some of their striking peculiarities, only shows their similarity to the case which is the occasion of this paper, and confirms the statement that the disease is not of frequent occurrence, and that but few instances are recorded.

But, upon a closer investigation of the first case, together with those condensed accounts which follow it, it will be seen that the disease has some common positive characters, and these may be stated in a general way in a few words.

Mollities ossium or osteo-malacia occurs in adult life, in persons previously healthy. It attacks the dense portions of the bone, before the spongy parts. It is attended by severe pain, which is often excruciating. Deformity suddenly occurs, of an angular character, by partial fracture or bending; and this deformity is never permanently removed. The general health fails; and though the appetite may continue, there is wasting and emaciation. No recoveries have taken place; death is certain. The *post-mortem* appearances show swelling of the bone and thickening of the periosteum. The middle part of the shaft, which is hard and laminated, is changed into spongy cancellated structure, which can be cut with a knife. The earthy matters of the bone are absorbed and the cells are filled with a semifluid, red, and oily substance. The bones become flexible in proportion to the degree of absorption of the earthy matter.

Although the account given above we believe to be a true and accurate description of the disease, we are bound, in view of the present literature of the subject, to present another side of the picture, and to state that not only very different but very opposite views are held as to the nature of mollities ossium, and that some of the distinguished modern writers upon pathology not only attach no faith to such an account as we have given, but equally discredit each other's views.

For instance, Rokitansky says :—

"It occurs chiefly in the bones of the trunk, and when the bones of the extremities are affected, they are so always in a subordinate degree. The deformities which result from mollities ossium are restricted to the trunk. The bones diminish in size."

Still more opposed to our views are Mr. Paget's statements, who, after examining numerous specimens in the Hunterian Museum, considers the disease essentially "fatty degeneration." He says:—

"Nothing can better express the character of the change than its similarity to fatty degeneration of other organs, in which we find the proper substances of the part gradually changed for fat, and the whole tissue spoiled, while the size and outer form of the part remain unaltered." And again, "These investigations were made in a collection containing specimens from nearly all the cases, with whose histories we are most familiar." In the second edition of Mr. Paget's valuable work, reference is made to three other cases subsequently reported, which confirm his view of fatty degeneration, and he says: "I have never seen a specimen *which appeared to fulfil in any degree the general notion of mollities ossium as a disease, consisting in the removal of the earthy matter of the bone, and the reduction of any part of the skeleton to its cartilaginous base.*" And again, after opposing Rokitansky's generalization, that it occurs more frequently in *females*, and in the bones of the trunk, and that the bones are flexible and not brittle, he concluded by the following remarks: "I think we may consider that there are two diseases included under the name of mollities ossium, namely, fatty degeneration, which these specimens show, and which seems to be more frequent in England; and the simple softening of bone, or rickets of the adult, to which Rokitansky's description alludes, and in which the bones are flexible rather than brittle, and appear reduced to a cartilaginous state." After reading such statements from such authorities, it is not surprising that Mr. Holmes, in the last edition of his valuable *System of Surgery*, should say, "the pathology of mollities is far from being satisfactorily established; and there can be little doubt that this has arisen, in a great part at any rate, from the fact that authors have confounded several different conditions under the same name. Some indeed make no distinction between mollities and fragilitas ossium, while others regard mollities as an affection allied to, if not identical with, rickets."

It would occupy more space than was intended, in giving the history of a case with a few remarks, if a contrast were now instituted between rickets and fragilitas ossium, and mollities, but it is proper to notice in passing, that rickets is a disease of childhood, occurring in those of originally defective and deficient health; that it is attended with but little pain, and that recovery is the rule. There is a deficiency of supply of the earthy material, and the bones, as they grow, become flexible, and are bent by the weight of the body as well as by muscular contraction. The bones of the lower extremities are bent, the spine twisted, and the pelvic arch falls in, and when adult life is attained, and ossification is completed, the results are bandy legs, sigmoid spine, and contracted pelvis.¹

And, it might be said of fragilitas, that it is a mere symptom or result, and not truly a disease; that brittleness is a condition, dependent upon age, fatty degeneration, thinning of walls, cancer, atrophy, etc. But if we limit its meaning as is usually the case to that state which accompanies a tendency to frequency of fracture, which has been met with by almost every surgeon, and which was always supposed to be dependent upon a want of proper proportion between the animal and earthy matters of the bone, and of which so many cases are recorded in the text-books and

¹ See Dr. Parry's papers, Amer. Journ. Med. Sci., Jan. and April, 1872.

journals, it can be readily seen that neither rickets nor fragilitas correspond to the views which have been expressed upon mollities ossium. And in many of the text-books of the day, even in Mr. Erichsen's *Surgery*, mollities and fragilitas are described under one head, and Mr. Tyrrell's case, in which twenty-two fractures occurred, and also Mr. Arnott's case, in which there were thirty-one, are quoted in exemplification of the subject. Nor should these remarks be terminated without an allusion, at least, to some of the recent articles which have appeared in the journals bearing upon this subject.

Mr. Pedlar, L.R.P.C., has presented a very interesting paper (*West Riding Lunatic Asylum Reports*, vol. i. 1871), entitled "*Mollities Ossium and allied Diseases*," in which numerous cases are reported illustrative of the subject of "breaking of ribs in asylums," in which very remarkable statistics are brought forth, but we hardly think that the disease corresponds in its essentials to mollities. Dr. Geo. Warder, superintendent of the county asylum at Carmarthen, states (*Lond. Journ. Mental Science*, Jan. 1871) that of twenty bodies of patients dying in 1870, nine were found with bones in an "abnormal and diseased state." The manifestations of the disease were mostly in the ribs and sternum, and the bones were soft and easily broken down.

Dr. Ormerod's description of cases (Dr. Barnes's paper, *Obst. Trans.*, vol. xiii. 1871; also *Amer. Journ. Med. Sci.*, July 1872) leads us to suppose that he described some other disease than mollities.

And Dr. Casati, of the Royal School of Midwifery at Milan, records during a period of eight years "7719 deliveries, of whom sixty-two presented evidence of clearly marked osteo-malacia." Almost all of the cases came from one valley in which the people lived in damp houses, and were overworked and badly fed; forty-one of these cases had "deformed pelvis."

The most complete and perhaps the most instructive paper recently published on this subject is by Mr. Arthur E. Durham, *Guy's Hospital Reports*, 1864, 3d series, vol. x. He details three cases, the first of which presented in a marked way the characteristic symptoms of the disease.

Previously healthy woman, æt. 45, the mother of four healthy children. After her last confinement was seized with pain in her lower extremities, which became œdematous. The pain became so severe that she fainted in attempting to dress herself, and falling from the edge of the bed broke her right thigh and was sent to St. Bartholomew's Hospital, where she remained five months. No reparative action took place, and about a month afterwards, whilst her bedclothes were being changed by the nurse, the left femur gave way; she did not feel it crack, it seemed merely to bend. Deep-seated and aching pain attacked the other bones, one after another giving way, in each instance bending rather than breaking. She became much emaciated and deformed, and her sufferings were very acute. Her appetite was tolerably good. After a short time her decline became rapid, and she resembled a person in the last stage of hectic fever. At the *post-mortem* it was discovered that all the bones had undergone those changes which are characteristic of true mollities ossium.

They could without exception be cut by the knife, and for the most part with great ease. The shafts of long bones were affected to the greatest extent; and seemed to consist of a soft, greasy mass, not unlike liver in appearance, but more gelatinous in consistence, inclosed in a thickened and altered periosteum. The pelvis was not notably distorted, though its bones were softened.

Besides reporting these cases, Mr. Durham collects many others, and is able to add 14 to "Litzmann's 136, whose treatise on the subject is the most complete yet published with the exception perhaps of Beylard's."

Out of 145 patients, 13 only were males and 132 females; of the females, 91 were first affected during pregnancy or very shortly after childbirth.

There were only 10 cases affected under 20 years of age. The great majority began to suffer when between 25 and 33 years of age. In a majority of the cases not immediately connected with pregnancy or childbirth the symptoms first manifested themselves in the lower extremities. In a vast majority of the 91 cases described as commencing in connection with pregnancy, the first symptoms manifested themselves in or about the pelvis and lower part of the spine. In 73 of the cases the disease was absolutely confined to the bones of the trunk, and in a very great many cases there is no evidence of any other than the pelvic bones having been affected.

Mr. Durham raises the question as to how many of these last cases are to be regarded as examples of true mollities. And we certainly are disposed to agree with him that many of the cases which have been alluded to in the previous part of this paper as presenting obstetric difficulties should rather be considered as cases of deformed pelvis originating perhaps in some other disease. His views as to the relations of mollities to rickets and fragilitas are also decided. "Mollities ought never to have been confounded, as it has been and still appears to be in the minds of some, with rickets on the one hand, and senile fragility of the bones on the other. In rickets the primary cartilages have never become properly ossified. In senile fragility the animal matter of the bones appears to be absorbed as rapidly, if not more rapidly, than the earthy constituents, and none of the characteristic general symptoms of true mollities are present."

Without even alluding to other papers, such as Mr. Dalrymple's, in the *Dublin Journal*, vol. ii., in which microscopical and chemical investigations are detailed, we will conclude these remarks with a *resumé* from Rindfleisch, which freely confirms the views that have been expressed as to the nature of mollities.

He considers that its principal and almost only anatomical sign consists in an abstraction of lime and gradual liquefaction of the solid osseous tissue. If we break off one of the smallest of the osseous trabeculae from the cancellated structure and treat it with carmine and then examine it microscopically, it will have the appearance presented in Fig. 182 (Rindfleisch, *Pathological Anatomy*). This osseous trabecula consists of two kinds of substances; an exterior one lying next to the medullary spaces, and to the Haversian canals; and an inner

one which follows the axis of the osseous trabecula. The inner one contains a perfectly normal osseous tissue; the bone corpuscles with their numberless anastomosing processes, and the strangely refractive thoroughly colourless basis-substance, are intact. The outer one, on the other hand, shows us a minutely striated basis-substance, coloured deep by the carmine, which only here and there exhibits small shaded lines as the last remains of formerly existing bone-corpuscles. The change which we here see before us, reminds us too much of the known change which osseous tissue undergoes in removing the lime by means of hydrochloric acid, that we could for one moment doubt that here also a decalcification of the osseous tissue (halisteresis, Frey) had taken place. This decalcification progresses upon every osseous trabecula from without inwards; we may observe its progress at the time upon the sharp line which separates the decalcified osseous tissue from the normal. Herewith it is interesting to see that this line does not run parallel to the outer contour of the osseous trabecula, but in just such indented curves, such as we otherwise only perceive upon the line of resorption of the osseous tissue in inflammations, caries, etc. He advances the opinion that an acid, proceeding from the medullary spaces and the Haversian canals, robs the bone-tissue of its salts of lime. The decalcification is the first act of the bone softening. Some time afterward follows the second act, the dissolution of the decalcified bone-tissue. This also advances from the medullary spaces towards the axis of the osseous trabeculae. The latter for some time consist only of bone-cartilage, then they become more and more thin at the centre, finally melt down and disappear from view.

ART. IX.—*Cases Illustrating the Application of Elastic Ligatures in Surgery.* BY STUART ELDRIDGE, M.D., in charge of Imperial School of Medicine, Hakodate, Japan. (With a wood-cut.)

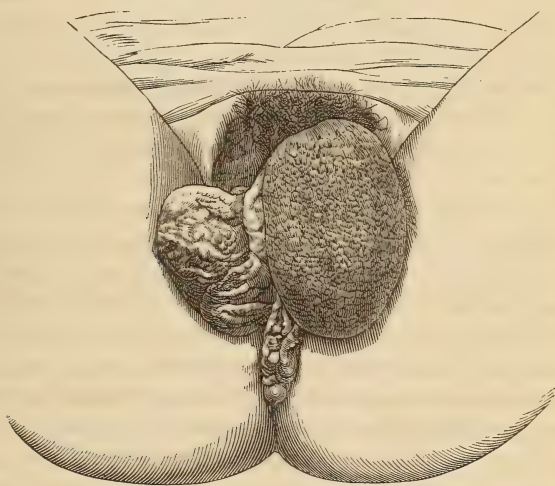
IN 1871 Mr. Henry Lee, of London, suggested that bands or cords of India-rubber might be advantageously substituted for the ordinary ligature in the strangulation of small tumours, and, more recently, Prof. Dittel, of Vienna, has independently arrived at the same conclusion while much extending the application of the idea. Prof. Dittel has operated, as our readers well know, by the rubber ligature for the removal of the testis and mamma, and has even amputated the thigh in this way, a proceeding in which he will probably be but seldom imitated.

During the year just past I have made much use of the elastic ligature for the removal of tumours, and in other cases in which gradual severance by ulceration was admissible, and with most gratifying results. I give below a few illustrative cases, premising that I have several times used the ligature in cases in which I should have preferred the knife, but in which the patients absolutely declined the more rapid operation.

1. *Vascular tumour of scalp.*—Kana Toshi, child, aged eight months. An angioma had existed upon the upper portion of the forehead since birth, and had rapidly enlarged, until, at the time I first saw the case, the tumour was larger than the half of a hen's egg, and of much the same shape; the skin very thin and vascular, not only over the tumour, but for

some distance around its base. Vaccination was tried, but with a negative result, so far as tumour was concerned, as might have been expected. June 10th, operated by rubber ligature. Two large hare-lip pins were first passed at right angles to each other, from side to side of the tumour, care being taken to pass the pins close to the pericranium so as to lie entirely below the diseased tissue. A very slight cut was then made in the skin below the pins around the base of the tumour, and into the groove thus made a thread of rubber was tightly tied. June 17th, the tumour had entirely separated save a central shred of tissue not more than one-tenth of an inch in diameter, which was cut off by the scissors. Cicatrization had so closely followed the rubber cord in its progress toward the centre that the space unhealed upon the removal of the strangulated mass was not more than one half the size of the base of the growth. July 30th, a firm, smooth, cicatrix three-quarters of an inch in diameter marks the former site of the tumour.

2. *Pedicellated fibrous tumours of external genitals.*—Sakura, prostitute, aged 20, syphilitic elephantiasis of labia majora and surrounding region. (See figure taken from a photograph.) These tumours were



exceedingly vascular, considering their fibrous character, and, as the patient entertained an invincible dread of the knife, it was resolved to remove them by ligature. July 20th slight cuts were made around the bases of the two larger tumours under local anæsthesia by carbolic acid, and small rubber bands shrunk into the grooves thus made. The base of the largest tumour was about four inches, that of the next in size about two inches in diameter. During the process of ulceration a dressing of carbolic acid solution was used to suppress fetor. July 27th. The smaller of the two tumours had separated to the normal diameter of the constricting band,

about three-eighths of an inch, and the remaining tissue was cut through with the scissors without loss of blood, the bloodvessels appearing to be sealed. July 30th. The larger tumour was found in similar condition, and its separation completed in like manner, again without hemorrhage.

The larger masses having been thus removed, several smaller tumours, of the size of a filbert to that of an almond, were strangulated by rubber thread, and in a few days dropped off. During the whole progress of the operation the patient suffered so little that her sleep was not interfered with, and it was almost impossible to prevent her running about the ward.

August 17th. Cicatrization was completed, and the cicatrices much smaller than the original cut surface. Patient discharged.

3. *Hæmorrhoids*.—K. J., male, aged 31, large external hæmorrhoids. December 14th, six ligatures of fine rubber thread were applied to as many tumours. The tumours being in a slightly inflamed condition, a line of strong carbolic acid was drawn around the base of each before the application of the ligature, though the usual incision of the skin was omitted. December 18th. The tumours have all dropped off. December 24th. Cicatrization has taken place, and the anus looks almost normal.

4. *Fistula in ano*.—G. J., male, aged 40. Fistula in ano extending from one inch above sphincter to a point two inches to left of anus; a second fistula of less extent existed on the right side. November 10th. Rubber thread was drawn through both fistulæ by means of an eyed probe, then tightly stretched and tied. The same day the patient, a sea-faring man, departed for Yokohama, but on his return, January 14th, informed me that on November 14th the ligature from the less extensive fistula came away, having entirely cut through, and, that three days later, that from the larger fistula, it also having finished its work. When I saw him on January 14th complete healing had taken place, and the action of the sphincter was normal, although, by the patient's own statement, he had been constantly on duty, and had paid but little attention to my directions as to the management of his bowels or of the wounds.

The foregoing are specimen cases only. I have operated on many others, more or less resembling those given, and, so far, always with satisfactory results.

There are undoubtedly many other circumstances in which the operation by rubber ligature will eventually be found useful. I believe it can be applied to the occlusion of arteries, perhaps even substituted for the clamp in ovariectomy, and, in a modified form, as a broad band with pad, to the cure of aneurism by distal compression.

The advantages of the rubber ligature in cases such as those detailed above, may be briefly summed up as follows:—

1. The operation is bloodless.
2. The ligature once applied requires little further attention, save in exceptional cases, but steadily cuts its way through till its elasticity is

exhausted. The pain and alarm produced by the necessarily often repeated tightening of the ordinary ligature has always formed a great objection to its use.

3. The liability to pyæmic infection would appear to be much less than in operations performed by ordinary ligature. Under the steady gentle pressure of the rubber the vessels are thoroughly occluded before being cut through by ulceration.

4. The elastic ligature is of a peculiarly non-absorbent and unirritating nature.

It should be remembered that fatty matters act upon India-rubber rather energetically, especially at the temperature of the body, so that in cases where the ligature must cut through any great depth of fatty tissue it is likely to break; but even should it do so, another can easily be substituted for the one broken. While I believe that, in all cases where gradual strangulation is indicated, the rubber ligature is to be preferred to the ordinary one of silk or other non-elastic material, I fully recognize the fact that it is open to many of the objections which have caused so many surgeons almost wholly to discard the operation by ligature in any form. I believe, however, that in at least three classes of cases, viz., vascular tumour, hæmorrhoids, and fistula in ano, it will be found the best method of operation. Further experience will show how much beyond this the use of elastic constriction may be advantageously extended.

ART. X.—*Report of Twenty Cases of Stricture of the Male Urethra, with Treatment.* By A. VANDERVEER, M.D., of Albany, N. Y. (With a wood-cut.)

THE following cases of stricture of the male urethra are presented to illustrate the treatment by gradual dilatation, by divulsion, and internal urethrotomy. They also illustrate the use of many of the more modern instruments now employed in the diagnosis and treatment of stricture.

CASE I. *Gradual dilatation; result good.*—May, 1867, C. W., unmarried, on account of intemperate habits for several years, applies for treatment. Six years ago contracted gonorrhœa; has had the disease, either in its acute or chronic stage, ever since; has practised the usual treatment with copaiba, cubebs, and various injections; noticed his stream of urine becoming small during the past three years, and now can only void it with much effort and straining; has a frequent desire to pass his urine during the night; no complete retention at any time, but fears it; desiring to be relieved, and leading a more temperate life, he is anxious for treatment; appears pale and thin, and states that he can attend to his duties only with the greatest effort. Upon examination a No. 3 black elastic olive-pointed bougie passes into the bladder. There is considerable gleet dis-

charge, and the urethra is decidedly sensitive. Meatus appears quite small; tr. ferri chloridi and fluid extract ergot ordered internally. Continued this treatment for nearly eight months, besides passing bougies two or three times weekly, gradually increasing in size, until No. 15 could be introduced with ease. The discharge ceased entirely, and the patient was directed to use the bougie occasionally, and to continue in his good habits. His general health is now excellent, and in appearance he is decidedly improved.

CASE II. Single stricture; gradual dilatation; recovery.—May 14, 1870, E. T. J., æt. 43, of irregular and intemperate habits, applies for treatment to relieve a troublesome and long-standing stricture. First attack of gonorrhœa in 1848; several attacks since; has pursued the usual treatment with copaiba, etc., internally, and has frequently used injections. Eight years ago noticed that the stream of urine was growing smaller, and for the past five years has emptied his bladder with great difficulty; gleet discharge during most of this time. Two years ago, while in San Francisco, was treated by means of bougies, and experienced some relief, the discharge ceasing for over a year; but, neglecting treatment, soon relapsed into his former condition. During the past year is obliged to void his urine every hour or two both night and day, and for the past three months could only relieve himself when sitting upon the water-closet, when he would, also, each time, have a small fecal evacuation from the bowels. Is unable to attend to business; is pale, and feels weak and very despondent; habits are now better, and is very anxious for a restoration of his health. Urine is alkaline; specific gravity 1020, no albumen; has never had complete retention, always being able to empty his bladder by means of hip-baths, etc. Upon examining the urethra to-day a stricture is detected about five inches back of meatus, through which, by gentle exertion, and without causing much pain, a No. 2 black elastic olive-pointed bougie passes into the bladder, but cannot pass smallest size bulbous bougie. Ordered tr. ferri, tr. cantharid., and fld. extract ergot internally.

May 15. Voids his urine with more ease, and, seeing already some improvement, is hopeful.

Sept. 10. Gradual dilatation has been practised two and three times a week; the past four weeks not so often, until now No. 14 steel sound, English scale, can be passed with little pain into the bladder. Not obliged to void his urine during the night, and only three or four times during the day; the stream is full, and under observation is voided with marked force. The discharge, which was quite profuse when dilatation was first commenced, has never ceased entirely, and the patient has gained in flesh, health, and courage; internal treatment continued.

Dec. 1. A No. 15 steel sound has been introduced about once a week, until now No. 16 can be passed with comparative ease; general health good; internal treatment discontinued.

June 1, 1873. Mr. J. has returned every two or three months to have No. 15 or 16 steel sound passed; health is fully restored, and urinary tract apparently as well as ever; is himself taught and directed to pass a No. 15 steel sound once a month for a year at least, and after that not so often. There has been no chill, or any unpleasant symptoms in this case, although the patient is of a very nervous temperament.

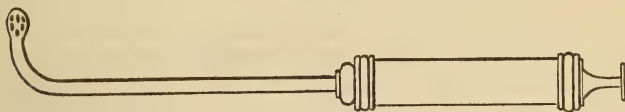
Sept. 23. Patient has passed No. 15 steel sound once a month, and twice at my office I have passed No. 16; no unpleasant symptoms;

doing nicely; habits continue good. To-day, with bulbous bougie, cannot detect any contraction of urethral canal.

CASE III. *Single stricture; gradual dilatation; recovery.*—August 29, 1870. W. C., æt. 27; habits temperate; first attack of gonorrhœa 18 months ago. The attack was an aggravated one, and attended with much swelling of the penis; severe pain for many weeks in urinating, and a troublesome chordee. Had gone through the usual routine of internal treatment and injection; had taken good care of himself while under treatment. Now feels debilitated and despondent, and appears thin in flesh; frequent desire to micturate during the day and night; there is a gleety discharge present, and the stream voided is small. Upon examination with various bulbous-pointed bougies, a decided stricture is detected with a No. 2 in the membranous portion of the urethra; a No. 2 black elastic bougie passes into the bladder, but causes considerable pain. Ordered 10 m tr. ferri with 8 m tr. cantharid., diluted with water, four times daily, and gradual dilatation by means of elastic bougies.

Continued under treatment for six months; passed bougies two or three times a week, besides using for the last three months, after the urethra had become well dilated, a weak injection of either zinci sulph., cupri sulph., or tannin, with the syringe shown below. The long nozzle of this syringe was especially constructed for this case, and the use of the tannin has been attended with beneficial results in other cases of deep urethral inflammation.

Reversible flow.



The general health is much improved, and the discharge has now ceased entirely; not obliged to urinate during the night, and retains his urine for a longer time during the day. No. 17 steel sound is passed with ease to the patient; instructed to pass No. 14 metallic sound at least once every two weeks and to report.

Aug. 1, 1872. Has retained good health, and the urinary organs are in good condition; has continued to pass the sound once and twice a month for a year; comes occasionally to have No. 17 sound passed; has not passed the sound so frequently for the past twelve months; there is no contraction; reports himself well.

Aug. 2, 1873. W. C. came to-day to have his urethra examined. Passes a good stream, and reports himself as feeling well; no discharge; has not used the sound during the past year. Passed No. 17 steel sound with ease; ordered to pass No. 15 steel sound once a month, and to report occasionally. With No. 12 bulbous-pointed bougie cannot detect any contraction of the urethra.

CASE IV. *Traumatic stricture; gradual dilatation; recovery.*—May 5, 1871. Rev. W. E.; kicked by a horse twelve years ago, the force of the blow received on the perineum. Passed some blood with his urine shortly after the injury; no complete retention at any time, nor was a catheter introduced at the time of the injury. The swelling and ecchymosis never very severe, no abscess formed, the patient gradually recovered from the effects of the injury, and in five months after passed his urine in a full-

sized, natural stream, without pain or effort. During the subsequent five years he enjoyed good health, until after exposure to cold he had some difficulty in passing his urine; had well marked symptoms of cystitis, obliged to empty his bladder occasionally during the night, and was annoyed during the day by dysuria. The stream of urine gradually grew smaller, and it required a greater effort to empty the bladder. He has grown worse until now, when he is compelled to empty his bladder every hour or two during the day and night. The stream has grown very small, and frequently the urine is voided only in drops; has lost strength, is emaciated and much depressed in spirits, being obliged at times to give up his occupation in consequence of this trouble. Has been dosed "ad nauseam" with buchu and many other diuretics. Upon examination to-day the urethra is found to be very sensitive, and No. 3 bulbous pointed bougie is arrested in the bulbous part of the spongy portion of the urethra. No. 2 passes into the bladder, but is held firmly in attempting to withdraw it at the point of stricture. Large sized bulbous bougies pass easily through the portion of the urethra anterior to the stricture. Ordered internally tr. hyoscyamus, tr. cantharid., bicarb. potassa, and elix. cinchona, with good generous diet.

Gradual dilatation was practised for two months, when No. 13 steel sound could be passed with ease into the bladder. Patient was now relieved from passing the urine during the night, and could retain it for three or more hours during the day. Internal treatment discontinued, and patient taught and directed to pass No. 13 to No. 15 steel sound at least once a month.

CASE V. Two strictures; gradual dilatation; good results.—July 1, 1871. F. J., æt. 23, habits fair; small in stature. First attack of gonorrhœa two years ago. Had the usual treatment internally, and used injections for six months; when about well had an impure connection, and contracted the disease for a second time. This attack proved more severe than the first; was attended with much swelling of the penis and great dysuria, also had chordee; treatment about the same as during first attack. Has a continual gleety discharge. Noticed about this time that the stream of urine was becoming smaller, with an increasing desire to micturate, frequently obliged to arise during the night to void his urine; has been in this state for six months previous to applying for treatment. Upon examining his urethra No. 5 bulbous bougie detects two well-marked strictures, one near the meatus, and the other in the membranous portion of the urethra. Tr. ferri and fld. ext. ergot prescribed internally. A No. 3 black elastic bougie passes into the bladder, but causes a smarting sensation at the points of stricture. Gradual dilatation was now practised two or three times a week. Continued under treatment six months. The stream now passed was full, the discharge had ceased, and he had no abnormal desire to micturate; No. 14 steel sound passed.

June 1, 1873. Has reported occasionally to have No. 14 steel sound passed; his general condition continues good.

CASE VI. Single stricture; gradual dilatation; recovery.—H. L., æt. 22, June 8, 1872, applied for relief of troublesome discharge from his penis. The discharge is accompanied by a frequent desire to micturate and a smarting sensation. Upon observation the stream of urine voided appears small, and requires considerable force. Is finely developed physically, and has not been subjected to exposure; habits temperate. Had his first attack of gonorrhœa in August, 1869; rather severe, from de-

scription of symptoms. The plan of treatment was with copaiba, etc., internally, until the middle of October, when, not improving as rapidly as he desired, he used, and but once, upon the advice of a friend, a strong injection of nitrate of silver. Four hours after, on attempting to micturate, found that his flow of urine had ceased, and for nearly twenty-four hours was unable to empty his bladder. This caused him great physical distress and uneasiness of mind. He was relieved at this time with some difficulty, and suffering great pain, by the introduction of a No. 8 gum-elastic catheter. After this he passed his urine naturally but in a small stream. From this time until February, 1870, he passed either No. 8 or 12 elastic bougie every other night. The discharge which was at first troubling him ceased, and passing, as he thought, a good stream, he stopped all treatment, having relied upon his own judgment as to treatment since using the injection of nitrate of silver in October, 1869.

From February, 1870, until the middle of last April he has been quite comfortable, at which time he noticed a return of the old gleet discharge, a gradual decrease in the size of the stream of urine voided, and increasing desire to micturate both night and day. Has had no exposure to a second attack of gonorrhœa. Upon examination to-day there was quite an abundant gleet discharge. Nos. 8 and 5 bulbous pointed bougies upon being introduced are successively arrested about six inches from the meatus. A No. 3 French olive-pointed black elastic bougie passes with slight effort into the bladder. Divulsion was proposed, but being decidedly opposed to the use of instruments, gradual dilatation was preferred. Ordered 10 m tr. ferri after each meal; gr. j quinia every four hours.

Aug. 1. Have used bougies, gradually increasing in size, from two to three times a week, until now a No. 16 steel sound is introduced with comparative ease. Quinia was discontinued after two weeks and the iron a week ago; no chills. The discharge has now entirely ceased, and the general health is much improved. Is instructed to use the steel sound, and to pass No. 16 once a week. There is no vesical irritation; patient passes his urine as naturally as he ever has, and is not obliged to empty his bladder during the night.

March 1, 1873. Has returned to the office about every two months, and had No. 16 steel sound passed. Is free from any gleet discharge, and is feeling well.

June 3. No. 16 steel sound passes with ease into the bladder. Cautioned as to the necessity of passing the sound occasionally. Large size bulbous bougie fails to detect any contraction of the urethra.

July 29. Treatment continued, and condition remains good since last date, and gradual dilatation practised two and three times weekly. Discharge has ceased. Patient discharged, and ordered to introduce No. 15 steel sound at least once a month.

The following case of obstinate gleet is one of many met with in practice, and illustrates the folly of internal treatment in the giving of medicines, use of injections, etc., without some attempt being made in some way to restore the urethra to its normal calibre:—

CASE VII. Obstinate gleet; single stricture; dilatation; recovery.—September 22, 1872, D. P., æt. 27, habits temperate. First attack of gonorrhœa a year ago; not severe. Treated for six months with copaiba and injections; no treatment during the past six months. At present has an annoying discharge, especially in the morning. Exposure to cold increases

the desire to micturate; complains of an unpleasant sensation in the region of the prostate. Objects to having any instrument whatever introduced; desires to be treated only with medicines, and as he is anxious to be married, desires an immediate cure. Declined to treat the case at all unless he submits to an examination. Patient leaves in a rage.

October 20, 1872. Returns, stating that he has taken medicines without any effect upon the discharge; is willing to submit to any examination necessary. No. 5 bulbous pointed bougie detects a stricture in the membranous portion of the urethra. Gradual dilatation was begun, and tr. ferri, cantharid., and fl. ext. ergot given internally.

February 1, 1873. Patient has continued under treatment, gradual dilatation being practised twice a week until now. No. 17 steel sound can be passed with ease. No discharge. Departs cured, with the expression that the next time he will believe the doctor.

CASE VIII. Single stricture; divulsion; recovery.—May 31, 1871, C. J., æt. 27, intemperate, admitted to hospital to-day. First attack of gonorrhœa three years ago; made a speedy recovery by internal use of copaiba, etc.; no injections used. Second attack a year and a half after; treated for six months with internal remedies and injections; at this time there was scarcely any discharge, but did not consider himself well. Soon after this, the gleety discharge still continuing, he noticed that his stream of urine was gradually becoming smaller, the smarting pain upon passing it more marked, that it took longer to empty his bladder, and was obliged to micturate frequently both day and night. This has been the condition of the patient for the past year. During the last two months is obliged to go to the water-closet nearly every time he desires to micturate; passes upon observation no distinct stream at present. His urethra presents a congenital hypospadiæ, about quarter of an inch of the urethral canal being absent at the meatus. Upon examining his urethra with different sized bulbous-pointed bougies, the smallest will not pass a stricture situated in the membranous portion. After injecting the urethra with warm oil, an attempt was made to pass a whalebone guide; although persevering for several hours for three successive days, none could be introduced into the bladder.

Patient took at this time internally tr. ferri and sulph. quiniæ, and flax-seed poultices were applied to hypogastric region. Keeps his bladder empty by frequent attempts to urinate. Had concluded to perform external perineal urethrotomy, but succeeded on the fourth day in a half hour's time, and after using eight guides, in introducing one past the stricture. On this, with some effort, a No. 2 tunnelled silver catheter drawing off about a gill of ammoniacal urine. Gouley's modification of Thompson's divulsor was now passed on the guide, and the stricture apparently fully divulsed; about two drachms of blood followed the operation; suffered but little pain.

Nos. 8 and 10 steel sounds now passed with ease. Patient ordered to continue iron and quinia. No chill or unpleasant symptom following, steel sounds to No. 15 were passed with little pain. Patient discharged from hospital June 15, 1871, with instructions to have No. 15 steel sound passed occasionally.

June 1, 1873. Two years after divulsion. C. J. has reported about every two or three months; have passed each time Nos. 15 and 16 steel sound without any difficulty. Has married since the operation, and become a father. General condition good.

CASE IX. *Relapse in five years after gradual dilatation; divulsion; use of meatotome; recovery.*—December 13, 1872, C. W. (Case I) again applied for treatment concerning his former trouble. Habits have been good since last under treatment, and has married. Had employed the bougie for nearly six months, when, feeling perfectly well, he discontinued its use. During the past few months has had a more frequent desire to pass his urine; has noticed a slight gleet discharge, and also that the stream of urine is smaller. On examining his urethra with a No. 3 bulbous-pointed bougie, a stricture is detected five inches from the meatus, which holds the bougie quite firmly on attempting to withdraw it. Gradual dilatation now employed for six weeks, but No. 10 black elastic bougie gives so much pain at the meatus that I determined to incise it, and attempt divulsion upon the deeper stricture.

Feb. 1, 1873. The meatus was freely incised with Gouley's meatotome, and a No. 14 steel sound passed down to the deeper stricture; no unpleasant symptoms ensued.

17th. Having first introduced the whalebone guide with Gouley's modification of Thompson's divulsor, the deeper stricture was fully divulsed; slight bleeding; the operation giving him no more pain than the bougie while practising gradual dilatation. No. 14 steel sound was passed into the bladder. Iron and quinia were prescribed during a week, and no unpleasant symptoms presented. Twice a week, for ten weeks, steel sounds up to No. 15 were introduced, at which time the discharge ceased, and he was discharged, with instructions to pass the No. 15 steel sound twice a month.

Oct. 1. C. W. has continued to use No. 15 steel sound weekly, feeling well and passing his urine with ease and as naturally as he ever did.

CASE X. *Single stricture; divulsion; recovery.*—May 23, 1872, W. J., æt. 34, temperate. Had first attack of gonorrhœa in May, 1865. Made an easy recovery in two months with the usual treatment without injections. In the early part of 1868 had a second attack, symptoms not more severe than the first. Used the same treatment for a year, but still had a constant gleet discharge. At this time was advised to use a strong injection of sulphate of copper, which caused him great pain, and resulted in almost complete retention. Has since abandoned all treatment; has had great difficulty in urinating, and can now pass but a small stream, and at times but a succession of drops. Obligated to micturate frequently during the night, and is frequently unable to perform the act without being seated upon the water-closet, and often has a passage from the bowels at the same time. Is at present thin and emaciated. Upon examining his urethra to-day with a bulbous bougie a stricture is found in the membranous portion, through which only a whalebone guide can be passed, and only after a half hour's steady perseverance, using six guides. No. 2 tunnelled steel sound was first passed on the whalebone guide, then the tunnelled divulsor and the stricture fully divulsed, with little pain and slight hemorrhage. No. 12 steel sound was now passed into the bladder. Ordered quinia and tr. ferri.

June 1. No unpleasant symptoms have followed. A No. 15 steel sound has been passed daily without great pain. Not obliged to empty his bladder during the night; is much improved; treatment to be continued.

Aug. 10. Patient has reported every two weeks, and had Nos. 15 and 16 steel sound passed. Condition is very much better. Internal treatment discontinued. Ordered to pass sound occasionally.

Oct. 30, 1873. W. J. has not reported since last note of case until to-

day. No sound used since Aug. 10, 1872. Passes a good stream. No. 16 steel sound passes with little pain into the bladder. Bulbous bougie fails to detect any remains of stricture.

CASE XI. *Single stricture; divulsion; recovery.*—H. J., æt. 45; hotel keeper, of intemperate habits. First attack of gonorrhœa in 1848, said to have been complicated with chancre in urethra. Treated with mild injections. Symptoms subsided in six to eight weeks. No difficulty in passing his urine after this attack. Second attack in 1861, which readily yielded to treatment in four or five weeks. No trouble in voiding urine after this—passing a good stream. Had a third attack in March, 1868, which proved to be more severe, the discharge making its appearance freely forty-eight hours after exposure. Treated as before with injection, etc.; had a severe attack of orchitis when partially cured. Had from the beginning difficulty in voiding his urine, while he noticed with anxiety that the stream was gradually growing smaller. After eight weeks' treatment he thought the discharge had entirely ceased, but since has had great difficulty in voiding his urine. Obligated to frequently void his urine drop by drop, both day and night. Sometimes would consume fifteen minutes in emptying his bladder, and at times obliged to assume almost every possible position to effect it.

November 30, 1872. Upon examination to-day a stricture is detected five inches back from the glans penis or meatus. After using several whalebone guides, one passed the stricture with slight effort, and entered the bladder. Upon this No. 2 tunnelled sound, then Gouley's No. 3 tunnelled silver catheter was passed, and through the latter the urine now flowed freely. Thompson's tunnelled divulsor was then introduced, and the stricture freely divulsed; pain not severe; slight hemorrhage. Immediately after No. 15 steel sound was passed; patient complaining of very little pain. Ordered internally 1 gr. quinia every three hours, and 10 m tr. ferri three times daily. This treatment was continued for a week, no chill or unpleasant symptom following. Nos. 15 and 16 steel sound were passed every other night. After this No. 16 sound was passed weekly for a month. Internal treatment now discontinued, and patient warned of the necessity of having sound passed occasionally. Has, however, not since reported.

CASE XII. *Traumatic stricture; partial divulsion; urethral fever; gradual dilatation; recovery.*—May 11, 1872. McC. E., æt. 24; unmarried; temperate habits. While following his daily occupation—paper hanger—fell astride of a step-ladder, and received a severe contusion on the perineum. States that he did not void his urine nor pass blood after the fall, but that the urine was drawn on the 12th, 13th, and 14th, and noticed an escape of blood after the use of the catheter. After the 14th, he passed his urine with the aid of warm hip-baths and anodynes, until July 20th, when he could only void it in drops. Has a constant desire to micturate, and can only do so with great effort when seated upon a vessel. At this time I was called to see him in consultation with his attending physician, Dr. Maguire. Upon examination with a bulbous-pointed bougie, it was arrested in the membranous portion of the urethra, and after injecting the canal with warm oil, no ordinary instrument would pass the point of stricture. After an hour's effort with whalebone guides, one was finally passed into the bladder, upon this No. 2 tunnelled sound, and then Thompson's divulsor; the latter causing such great pain and distress the divulsion was not completed. After this, however, the urine

passed more freely, but the imperfect divulsion was followed by severe urethral fever, which did not yield for several days to the use of quinia in large doses, tr. aconite, anodynes, external application of heat, etc., etc.

July 25. The urethral fever has subsided and only No. 7 steel sound can be introduced with gentleness into the bladder, causing little or no pain. No great pain following the use of the steel sound, gradual dilatation was practised up to September 1, 1872, when No. 18 steel sound could be passed into the bladder with very little pain. No. 17 and 18 steel sounds were now passed once a month.

September 10, 1873. Patient, at request of Dr. M., reported to-day, and No. 18 steel sound can be passed with ease. Condition good. No vesical irritation. Directed to use No. 17 steel sound once every month or two.

CASE XIII. *Two strictures ; use of meatotome ; dilatation ; divulsion ; partial recovery.*—S. C., æt. 26, unmarried ; habits temperate. *July 10, 1872.* The patient presents himself to-day with the following history. It is here given verbatim : "First noticed a slight discharge from the penis on the evening of the 27th of June, 1871, having on the 24th previous been in a drenching storm all day and thoroughly wet through ; took sandalwood oil without any perceptible effect for three weeks ; then took cubebs and copaiba paste for about a month ; neither a diminution nor increase of the discharge ; consulted a physician who gave me uva ursi and an injection of sulphate of zinc. Up to this time, about two months having elapsed, had no trouble in urinating, there appearing to be no inflammation, no chordee, nothing but the simple discharge. After using the injection a short time, the penis began to swell, the discharge became copious, and micturition very painful. This state of things lasted for a great while, during which time I had used several different injections and a variety of prescriptions. But finding no benefit I stopped taking medicines, and simply used a wash of sal soda, by which I succeeded in keeping the parts perfectly clean and in reducing the inflammation. Then took cannabis and cantharides—homœopathically—but without any apparent benefit."

Upon examining the urethra with a No. 3 bulbous-pointed bougie, a stricture is detected just behind the meatus, and another in the membranous portion of the urethra. There is a free gleetty discharge, with a constant desire to micturate. The stream of urine has gradually decreased in size, and it requires great effort on the part of the patient to empty his bladder. The stricture behind the meatus was incised with a common bistoury, and Nos. 10 and 12 elastic bougies passed down to the deeper one. Slight hemorrhage. Directed to use No. 12 bougie, and to introduce it for two inches ; but the discharge ceasing, he neglected himself and applied for no further treatment until August 24, 1873. The stream of urine was decidedly small, and the desire to micturate frequent. Obligated to empty his bladder frequently during the night. No. 2 bulbous-pointed bougie will hardly pass the stricture back of the meatus, but passes the deeper stricture with ease. The stricture near the meatus was now freely incised with the meatotome ; hemorrhage profuse and arrested with some difficulty. No. 14 steel sound passes down to the deeper stricture. Sound passed for four successive days, and at each time the hemorrhage was quite annoying.

August 29. Being exposed to a cold rain, the patient had severe chills followed by diarrhœa and exacerbations of fever for nearly a week. Urine scanty, and micturition attended with much pain in lumbar and hypo-

gastric regions. Iron and quinia ordered internally, with heat, etc., to be applied externally. No sound having been passed during the illness of the patient, the stricture back of the meatus had again somewhat contracted.

September 7. Patient being in good condition, a whalebone guide was passed with little effort through the deeper stricture into the bladder, on this No. 2 tunnelled sound, then No. 3 tunnelled silver catheter, and about a gill of urine withdrawn. After this, Gouley's modification of Thompson's divulsor was introduced, and the stricture in the membranous portion of urethra thoroughly divulsed, attended with much pain and some hemorrhage. No. 10 steel sound was now readily passed into the bladder. Quinia and iron ordered to be continued. No unpleasant symptoms followed.

19th. Gradual dilatation having been practised daily, and No. 13 steel sound scarcely passing the meatus, the latter is again freely incised with the meatotome. Hemorrhage considerable. Nos. 15 and 16 steel sound passed for a short distance.

October 1. Patient's condition good, except sensitiveness of the urethra near the deeper stricture. The passage of a larger than No. 10 steel sound causes much pain and distress at this point. Directed to continue the use of tr. ferri with mucilaginous drinks.

November 1, 1873. Gradual dilatation has been continued until now. No. 13 steel sound is passed with comparative ease. Ordered to continue treatment.

CASE XIV. Three strictures; divulsion; gradual dilatation; use of meatotome, and Gouley's dilating urethrotome; recovery.—C. T. A., sent from Bennington, Vt., for treatment; æt. 30; of intemperate and irregular habits; saloon keeper. Two years ago had first attack of gonorrhœa, very severe in character, and attended with chordee and painful micturition. Considerable time elapsed before the symptoms subsided, and has not been free from a gleet discharge since. Injections were used with bal. copaiba, etc., internally for some time. A year ago had second attack of gonorrhœa, for which the usual treatment was pursued for three months without injections. Gleet discharge has continued. Six months ago, after an impure connection, noticed a chancre on the outer surface of the glans penis, which yielded readily to treatment; very little internal treatment. During last three months has voided his urine with some difficulty, having also a frequent desire to micturate, and requiring a long time to empty the bladder. The stream of urine has become gradually smaller, until at times it could only be passed in drops. Is obliged to empty his bladder frequently during the night. For the past year has himself occasionally passed a No. 5 English bougie; has not made use of it during the past six weeks, being unable to introduce it for any distance into the urethra.

March 20, 1873. Applies to-day for treatment, fearing that if he is not soon relieved, he will be altogether unable to void his urine. His mouth, upon examination, presents several mucous patches, and there are patches and condylomata about the anus. Upon examining the urethra with a No. 6 bulbous-pointed bougie a stricture is detected just back of the meatus; it is also arrested at a point $5\frac{1}{2}$ inches from the meatus. No. 3 will not pass this point. After some effort with eight whalebone guides, one is finally passed into the bladder, upon which a No. 2 tunnelled sound was guided with little effort, and attended with no pain. A No. 3 tunnelled

catheter was now passed, and a small quantity of urine was withdrawn, showing that the instrument had passed into the bladder. The patient being unable to leave his business, and wishing to return home the next day, I determined not to operate on the stricture near the meatus at present, but to use the divulsor on the deeper one. The instrument was passed easily on the guide, and the stricture was divulsed until the index marked No. 12, when, there being much pain, I desisted, about half a drachm of blood following the operation. Ordered to take 1 gr. quinia every three hours, and report in the morning.

21st. Called this morning, stating that he had not passed so comfortable a night for a long time. Passes, he says, a good stream; no chill or fever. A No. 9 Thompson's steel sound was now passed with ease and little pain. Ordered to drink flaxseed tea, continue quinia, to keep quiet, and to remain in the city for another day at least.

22d. No chill or fever. The introduction of No. 9 steel sound is attended with little pain. Complains of considerable pain near meatus when attempting to introduce No. 10. Being anxious to return home, he is ordered the same treatment as before, and in addition a gargle of potass. chlor. and ammon. mur. for his throat, and to return in three days.

26th. Is feeling much better; no chill or fever; passes his urine less frequently and better than for a year past. No. 9 steel sound is introduced with ease. I now wished to incise the stricture near the meatus, but the patient being obliged to return home desired me to wait for a few days longer. Same treatment to be continued.

31st. States that his throat and anus are troubling him, but feels much improved as regards his urinary difficulty. The stricture near the meatus was now incised with the meatotome, and a No. 11 steel sound passed with little pain into the bladder. Very little hemorrhage. Ordered to introduce night and morning a No. 12 elastic bougie an inch into the urethra, so as to prevent contraction of the stricture near the meatus. Ordered to take, two or three times daily, a pill of the following: R. Hydrarg. chlor. corrosiv. gr. $\frac{1}{8}$; extract hyoseyam., extract gentian., aa gr. j; ferri chlorid. gr. $\frac{1}{4}$, M.; and ung. hydrarg. ammoniat. to be applied to the anus two or three times daily. Also to continue gargle for throat. Ordered to report in a few days.

April 5. No chill or fever; progressing finely; feels much improved in every respect; obliged to urinate but once or twice during the night. No. 13 steel sound passes with little difficulty. To continue treatment and report in a week.

12th. Secondary symptoms improved; sleeps well during the whole night, and states that he is passing his urine as well as ever. Nos. 13 and 14 steel sounds pass with ease, but No. 15 causes much pain about two inches back from the meatus, and at the meatus itself. With a No. 10 bulbous pointed bougie a well-defined stricture is detected two and a half inches from the meatus. This stricture is to be incised with Gouley's urethrotome. To continue treatment.

24th. Has not reported on account of marked improvement. Same instruments as were used on the 12th, now introduced with ease; condition good. Wishing to return, he is instructed to use No. 14 steel sound and to pass it every four days, and to report in two weeks. To continue treatment for secondary symptoms.

May 10. Has used No. 14 sound without difficulty, and is much improved in health, secondary symptoms having subsided very decidedly.

No. 15 steel sound causing much pain at the meatus when introduced, the latter was again freely incised with the urethrotome, when Nos. 15 and 16 were passed, but causing much pain at the stricture, two and a half inches back, ordered to use large bougie, and keep the meatus well opened.

15th. No. 15 steel sound is introduced without difficulty. Wishing to return, he is ordered to use No. 15 twice a week, and to await results before treating the stricture two and a half inches back.

August 1. The stricture two and a half inches back from the meatus was freely incised with Gouley's dilating urethrotome, and No. 16 steel sound passed into the bladder with ease; very little hemorrhage followed. General health very much improved; directed to use No. 15 Thompson's sound every two weeks. The throat symptoms becoming troublesome, he is directed to take three of the pills prescribed before daily.

September 1. Mr. A. reports himself as doing well; passes Nos. 15 and 16 steel sound without difficulty. Urinates as when in perfect health. Continued treatment.

CASE XV. *Abscess and vesical fistula in perineum, also fistula in ano; two strictures; gradual dilatation and use of Vollemier's divulsor; good result.*—Service of Dr. J. H. Armsby. October 28, 1871, McC. D., æt. 24, pale, emaciated, admitted to hospital to-day. Has had several attacks of gonorrhœa; treated internally, and also used injections, etc. Upon examination a fistulous opening is discovered on the left side, and in front of the anus, connecting with the bowel and also the urethra. There is continual discharge of fecal matter and gas, and also of urine when he attempts to urinate. Quinia and tr. ferri ordered internally with generous diet; passes a moderate sized stream of urine, but with difficulty.

November 20, 1871. This condition having improved, the fistula in ano was operated on in the usual manner. Twelve to fourteen hours after the operation an alarming hemorrhage set in, and was finally controlled with the greatest difficulty by means of liq. ferri subsulph. and compressed sponge. Although considerably weakened by the hemorrhage, the operation proved successful as regards the fistula in ano. The fistulous connection with the urethra still remained open, and urine escaped whenever an attempt was made to empty the bladder.

January 1, 1872. Service of Dr. Vanderveer; McC. D. is still in bed, but improving slowly.

20th. Having had some trouble in voiding his urine, a careful examination was made which revealed two strictures in spongy portion, one two inches, the other four inches from the meatus. After some effort a small whalebone guide was passed into the bladder, and on this Gouley's No. 3 tunnelled silver catheter; about a pint of urine was withdrawn. On account of the great pain attending the operation he was anæsthetized. This exhausting him very rapidly, the catheter only was passed. By aid of a No. 3 elastic bougie urine was passed much more easily, and with more freedom than for a year past; several chills and a sharp urethral fever followed the operation. Being in a weak condition, the iron and quinia were continued, and further operative proceeding abandoned for the time being.

March 1. Patient is improving and is about the ward. Dr. Swinburne, while in temporary charge, during illness of Dr. Vanderveer, finding the patient in good condition, after having chloroformed him, passed Vollemier's divulsor and ruptured both strictures; considerable hemorrhage

following, but no other unpleasant symptoms. Nos. 8 and 10 steel sounds were now passed with ease. Patient was directed to pass No. 10 steel sound. The fistula in the perineum connecting with the urethra is now entirely healed. Discharged from the hospital June 1, 1872. Patient not heard from since.

CASE XVI. *Two strictures; use of meatotome and urethrotome; urethral fever; recovery.* Reported by Dr. Whitehorn, house physician, July 25, 1873.—R. W., Greenville, Greene Co., N. Y., æt. 28, strong and robust constitution; admitted to hospital as a private patient. Contracted gonorrhœa four and one half years ago, for which he consulted no physician until it had become a chronic gleet. Eight months after thought he had recovered, when after an occasional spree, he noticed a discharge which continued for a week at a time; was in this condition for a year, when he sought medical advice. Bougies were used, the discharge ceased, and he micturated freely again for six months. About this time drinking freely of cider, the discharge again appeared. There was also renewed dysuria. Took bal. copaib. and spts. æth. nitros., with some relief. Up to four months ago his condition became more and more aggravated, when he could only pass his urine by drops, and with more comfort when seated upon a bench than otherwise. This condition was alike at all times, being obliged to micturate every few minutes, else the urine dribbled away; had sharp momentary pain in inguinal region when nearly through micturating. Upon examination to-day (July 25, 1873) a slight stricture is detected half a inch back of the meatus, and another in the spongy portion of the urethra, through which No. 3 bulbous-pointed bougie will not pass. Urine of a pale colour, slightly acid; no albumen. Ordered, R. pulv. Tully grs. v, every two hours. R. tr. ferri chlorid. mx , three times daily. R. inf. ulmi, as a drink ad libit.

26th. Bowels moved freely; feels somewhat better; slept fairly; with some trouble a whalebone guide is introduced, on this No. 2 tunnelled sound, then No. 3 tunnelled silver catheter, after which the urine was voided with comparative ease.

27th. Slept well; urinated freely throughout the day; appetite improving.

28th. Condition as yesterday; this P. M. divided first stricture with the meatotome; operation almost painless; now passed No. 14 steel sound through and as far as second stricture; very little hemorrhage.

29th. Improving; during the forenoon introduced No. 16 sound through divided stricture; attended with considerable pain and hemorrhage; no other unfavourable symptoms.

30th. Nos. 14 and 16 sounds were introduced down to second stricture with but little pain and hemorrhage.

31st. Doing well.

August 1. Condition good; at 12 M. introduced Gouley's urethrotome upon guide, and divided second stricture from before backward on floor of the urethra. Passed No. 10 sound into the bladder, attended with very little pain and hemorrhage. At 3 P. M., patient was seized with rigors; applied hot water to feet and extra blankets ordered; relieved in about five minutes; pulse 90, soft and full; skin warm and moist; countenance anxious. Shortly afterwards, attempting to use the commode contrary to orders, he suddenly became faint and much prostrated; pulse 100, soft and full; profuse perspiration; face wan and anxious; respiration sighing; voice weak; stimulants administered cautiously. Shortly afterwards again seized

with rigors; applied heat to feet and spine, sinapism to epigastrium (to relieve nausea). Gradual improvement; 9 P. M. temp. 103° ; pulse 98 to 104; skin moist. Ordered R. quiniæ sulph. grs. iij, every two hours. R. infus. lini sem. for a drink ad libit. To continue the iron; hot hop pillows applied to lumbar region; large flaxseed poultice over abdomen.

2d. 8 A. M., passed a sleepless but comfortable night until 3 A. M., when he had a slight chill, lasting but a few minutes; usual treatment; micturated once during the night, passing about 8 oz. of urine; pulse 80; temp. 99° ; countenance cheerful and light; no sound used. 3 P. M., was again seized with rigors for a few minutes, followed by profuse perspiration; pulse 84; temp. 102° . 9 P. M., pulse 74; temp. $99\frac{1}{3}^{\circ}$; usual treatment.

3d. 8 A. M., pulse 74; temp. 99° ; doing well. 3.15 P. M., had a chill lasting fifteen minutes; great prostration; pulse 96; temp. $103\frac{2}{3}^{\circ}$. 9 P. M., pulse 74; temp. $103\frac{1}{3}^{\circ}$; skin warm and moist; usual treatment combined with quinia; hot hop pillows and poultices were applied.

4th. 8 A. M., pulse 74; temp. 99° ; passed a comfortable night under influence of Tully powder. R. pil. quiniæ sulph. gr. j, five every two hours up to 6 P. M. 3 P. M., though no unfavourable symptoms manifested themselves, ordered hot applications as a preventive to chill. 9 P. M., pulse 98. Free secretion of urine; passed No. 8 steel sound.

5th. 9 A. M., pulse 66, regular and strong; tongue furred; slept well; skin moist and warm. 9 P. M., pulse 54; temp. 96° ; appetite good, and sleeps occasionally. From 8 A. M. to 6 P. M., took 5 grs. quinia every two hours, using at the same time hot applications as before; now decreased the quinia to grs. iij, every two hours.

6th. 9 A. M., pulse 75; temp. 97° ; slept well; appetite good; bowels regular. 9 P. M., pulse 68; temp. $97\frac{1}{3}^{\circ}$; passed No. 10 sound.

7th. 9 A. M., pulse 69; temp. 98° ; doing well.

8th. 9 A. M., pulse 70; temp. 97° ; doing well. At 4 P. M., introduced Nos. 10 and 12 steel sounds without trouble. At 6 P. M., had a slight chill; pulse 102; temp. 100° . Continued usual treatment, and gave R. tr. aconiti. rad. gtt. ij every two hours. 11 P. M., feeling much better.

9th. 9 A. M., slept well; pulse 72; temp. 98° . From this time until his discharge, August 11th, his progress towards recovery was uninterrupted. He had 10 m tr. ferri three times daily and one grain of quinia every three hours. The urethra admitted the easy passage of No. 16 Thompson's sound.

October 1. R. W. has reported every two weeks, and No. 16 Thompson's sound was passed. Is improving in general health and strength. Is given No. 16 black elastic bougie, and directed to pass it himself once a week. Has continued the use of the iron and quinia since leaving the hospital, 10 drops of the former, and three grains of the latter three times a day.

CASE XVII. *Gradual dilatation; use of urethrotome; stricture of large calibre and use of Gouley's dilating urethrotome; recovery.*—December 10, 1872, D. C. M. A., æt. 35; health good; habits temperate. Had a severe attack of gonorrhœa five years ago; treated with copaiba internally and injections; has had a slight gleet discharge since. Two years ago had cystitis, and since then complains of much pain, and a sensation of heat in the region of the prostate gland. There has been a frequent desire to micturate, and obliged to arise two or three times during the night to empty his bladder. Has also noticed during the past six months

that the stream of urine has become quite small. Upon examination with a No. 5 bulbous-pointed bougie, a stricture is detected one-quarter inch back from meatus, and another in the membranous portion of the urethra. Ordered tr. ferri and fluid extract ergot internally. Gradual dilatation was practised upon the deeper stricture two and three times a week until March 1st. The strictures being very unyielding and the introduction of No. 10 steel sound causing great pain at the meatus, the latter, including the first stricture, were freely incised with the meatotome; the patient desiring not to have divulsion performed upon the deeper stricture. No. 14 steel sound passed down to the deeper stricture. No unpleasant symptom followed. The use of the meatotome caused much less pain than the bougie or sound while practising gradual dilatation. The deeper stricture was now gradually dilated.

May 1. On passing No. 15 steel sound there is great pain at the meatus, which had somewhat contracted; this was again incised, with no unpleasant symptom following. The discharge has now ceased; micturates freely and with ease; reports himself as feeling very well; internal treatment discontinued.

July 1, 1873. No. 16 steel sound has been passed once a week; patient improving; instructed to use a No. 12 elastic bougie once a week, and to report occasionally.

August 1. S. returns reporting that for the past two weeks has noticed occasionally in the morning a moisture about the meatus, and that it annoys him; notices also after urinating, when he believes the act completed, an escape of several drops of urine. Upon examining his urethra carefully with a No. 11 bulbous-pointed bougie, a stricture of large calibre is detected three inches from the meatus. Gouley's dilating urethrotome was then introduced, the stricture well dilated and incised; considerable hemorrhage followed and continued for nearly two days. No. 17 steel sound was now introduced with no unpleasant symptom following; no stricture can be detected at present.

September 1. Nos. 16 and 17 steel sounds have been passed weekly; noticed no moisture of the lips in the morning, and no dribbling of urine after emptying his bladder.

25th. Patient continues well; passing No. 16. steel sound about once a week.

CASE XVIII. Five strictures; gradual dilatation; use of meatotome; partial recovery; patient to return for further treatment.—September 2, 1873. McG. J. F., æt. 45; habits temperate; first attack of gonorrhœa in 1868; was very severe in character and attended with much swelling of penis; painful chordee and a very profuse discharge; treated with little benefit for nearly a year with copaiba, etc. During most of this time the discharge continued, attended with much pain and scalding, and a frequent desire to micturate. He finally refused any further treatment, and after a short time found himself somewhat improved. During 1870, notwithstanding a constant gleety discharge, he was quite comfortable, not being obliged to pass his urine so often, and effecting it with comparative ease. During the early part of 1871 he was kicked by a horse, receiving the force of the blow in the testicles and penis. These organs swelled very rapidly, became very ecchymotic, and patient was confined to his bed in consequence during several weeks. Passed frequently small quantities of urine mixed with blood; no complete retention; six months after recovering from the injury he had sufficiently recovered to again attend to his duties.

He now noticed that the stream of urine was smaller than usual, but could always empty his bladder; obliged to micturate frequently during the night. In November, 1872, while riding a vicious horse he was thrown against the horn of the saddle and injured his penis and testicle for a second time. The swelling and ecchymosis were as great as when first injured; greater dysuria; and attended with hæmaturia; confined to the house during two weeks. From this time until September 2, 1873, he has gradually grown worse, voiding his urine from twenty-five to thirty times a day, and very often during the night, always attended with excruciating pain. It takes him from five to ten minutes each time to empty his bladder. To-day he presents himself for treatment; is much emaciated and depressed in spirits; has tried all the different "pathies," and has very little faith in any treatment. Upon examination the under surface of the urethra feels roughened and indurated, and there is found in the perineum a swelling about the size of a hen's egg. The latter has developed itself gradually during the past three weeks, and he is certain that it grows larger when attempting to urinate, and decreases in size after emptying his bladder; the swelling is hard to the touch; very painful, and especially so on attempting to urinate.

Upon attempting to explore the urethra, after injecting the same with warm oil, the smallest bulbous-pointed bougie is arrested about two inches from the meatus, and detects two well-defined strictures at this point, beyond which it will not pass. After some effort and the use of five whale-bone guides, one is finally passed into the bladder; on this a No. 2 tunnelled sound, and then, although attended with great pain, Gouley's No. 3 tunnelled silver catheter, through which about two ounces of very offensive urine passed; some hemorrhage followed. No. 3 bulbous-pointed bougie now detects four well-defined strictures in the spongy portion of the urethra, one near the meatus, and the others about three-quarters of an inch apart. The same bougie also detects a stricture in membranous part of urethra, passing it and entering the bladder, causing great pain all along the urethra, and eliciting from him the remark that he would have to be anæsthetized if the operation was to be repeated; ordered rest, tr. ferri et quiniæ sulph. internally, and the application of linseed meal poultices to the perineum and hypogastric regions.

September 4. No chill; passes his urine with more ease and less frequently; feels encouraged; internal treatment continued. No. 3 black elastic bougie passes with ease, and little complaint on part of patient.

October 15. Has continued the iron and quinia; improved in appearance; has gained strength and appetite, and is very much encouraged; elastic bougies have been passed every day or two, the urethra gradually becoming accustomed to their use, until No. 10 passes with little pain, excepting at the meatus. The swelling in the perineum has entirely disappeared; not obliged to empty his bladder during the night, and but once every two hours during the day; the passage of No. 10 steel sound causing some pain at the meatus, the latter is incised with the meatotome; very little hemorrhage: ordered to continue quinia and iron.

22d. To-day passed No. 10 steel sound with ease into the bladder. The swelling in the perineum has entirely disappeared. Is passing a good stream, and not obliged to empty his bladder during the night.

The patient is called away from the city for six weeks; is ordered and instructed to pass a No. 10 elastic bougie two or three times weekly.

CASE XIX. *Two strictures; gradual dilatation; divulsion; partial recovery.*—April 12, 1872. McG. H., æt. 28; intemperate and dissipated; contracted first attack of gonorrhœa five years ago; recovered in about three months after pursuing the usual treatment; no injection used. After three years had another attack, which proved to be severe; was treated for a long time with copaiba, etc., internally; also used a variety of injections; has had a constant gleet discharge since last attack, which increased after connection and was frequently attended with scalding and a profuse yellow discharge.

Condition would improve with internal treatment; habits bad to within two months, when he stopped drinking, etc. Upon examination, two strictures are detected four and one half, and five inches from meatus. The stream of urine has been growing smaller during the last three months, and is voided with difficulty. No. 3 black elastic French bougie passes with some effort into the bladder.

June 20, 1872. He has taken internally tr. ferri, ergot, and cantharides; elastic bougies, gradually increasing in size, have been passed two or three times a week until No. 10 gives so much pain that he objects; a whalebone guide was now passed and upon it Gouley's modification of Thompson's divulsor, and both strictures thoroughly divulsed; less painful than the passage of the bougies; passed No. 12 steel sound; iron and quinia ordered internally.

July 2. No unpleasant symptom followed the divulsion; discharge almost entirely ceased; passed No. 13 steel sound; health much improved and feels encouraged; not obliged to void his urine during the night.

November 1. Have introduced No. 13 and 14 steel sounds once or twice a week with little effort; ordered to pass sound occasionally.

July 27, 1873. Reports for first time to-day since last November; habits have been good; feels excellent; passes a good stream; no gleet discharge; has passed the sound but a few times. Upon examining his urethra, only No. 10 sound can be passed; the stricture four and one-half inches from meatus has contracted considerably; the second one, five inches from meatus, cannot be detected with a bulbous-pointed bougie which passes the first stricture. Promises to call once a week until first stricture is dilated, or internal urethrotomy performed; no further internal treatment, as health is excellent.

October 1. Has failed to call again.

CASE XX. *Six strictures; gradual dilatation; use of meatotome; result partial; case still under treatment.*—W. H. J.; æt. 27; irregular habits; had first attack of gonorrhœa five years ago; used a strong injection of sugar of lead (20 grs. to ʒj). This aggravated his trouble, and for three months he passed bloody urine. A year after had a second attack; after this "a sore," as he terms it, formed on the under surface of the penis; an abscess following, a physician lanced it, and patient states "that he cut into the urethra." The abscess filled again and was lanced; after this he improved.

Two years ago had another attack, when an abscess again formed in the same place; had it lanced again, and states that "it healed by the external application of calomel." Five months ago had a chancre for which he was treated by a physician; the abscess again filled, and for this he now applies for treatment; first noticed that he had a stricture four years ago; gradually grew worse until two years ago, when he had almost complete retention. He was in the west, and a surgeon there operated on him while

under the influence of chloroform; was obliged to use a bougie once a month after this for a year.

September 10, 1873. To-day on applying for treatment he states that for the past two months he has not been able to use the bougie; that his stream of urine has been gradually growing smaller, until now it is frequently passed only in drops; that it requires great force on his part; that two weeks ago the fistulous opening on the under surface of the penis began discharging urine, and has given him much pain and annoyance since. On examination the meatus will scarcely admit No. 5 bulbous-pointed bougie, and is arrested three-quarters of an inch back from the meatus. The smallest sized elliptical bulbous bougie is with some effort, and after injecting the urethra with warm oil, passed into the bladder. On introducing it a stricture is detected in membranous part, and four distinct ones in the spongy portion of the urethra, also one at the meatus. The fistulous opening is about midway in spongy portion of the urethra externally, and communicates with the internal portion of the canal about one-half inch further back. A small silver probe can be passed through into the urethra. There is an unpleasant gleety discharge; urethra very sensitive; patient is compelled to pass urine very often day and night; ordered internally *tr. ferri*; also, gradual dilatation is commenced.

24th. No. 8 olive-pointed bougie can now be passed into the bladder; the fistulous track has closed; passes urine with more ease; treatment continued.

October 10. To-day No. 10 elastic bougie, giving much pain in stricture near meatus, the latter is freely incised; hemorrhage quite profuse and not easily controlled; is much improved in appearance and general health; ordered to pass No. 12 bougie beyond meatus night and morning.

14th. Though the hemorrhage has been somewhat troublesome it is now arrested, and can, with ease, pass No. 10 steel sound into the bladder; says he is sure that he is passing a larger stream than he ever did; is not obliged to empty his bladder at night; the gleety discharge has diminished. On examining his urethra with No. 5 bulbous-pointed bougie, which passes without much trouble into the bladder, all the strictures spoken of can be distinctly defined. The use of Gouley's dilating urethrotome is suggested for treating strictures in the spongy portion of the urethra, but he objects so decidedly that gradual dilatation is necessarily continued; internal treatment continued.

November 10. Patient remains about the same; the attempt to pass a larger than No. 10 steel sound causes great pain in spongy portion of the urethra.

Gleety discharge has about ceased, and patient is feeling, as he says, about well; has gained much in health and flesh. On a proper representation of his case, he states that after having attended to some very important business matters, will allow the use of such instruments as we think best.

Internal treatment discontinued; use of No. 10 steel sound continued twice a week.

From the foregoing cases we are led to believe that the treatment of stricture, by gradual dilatation when possible, is by far the simplest and safest method. That at first, in this method of treatment, the soft olive-pointed bougie is the best, until No. 7 or 8 is reached, and then the metallic sound is more rapid in its results and equally as safe.

That to insure success the gradual dilatation must be kept up for years at intervals.

That in strictures of small calibre, where it is only possible to introduce the whalebone guide, divulsion in the membranous portion, and internal urethrotomy in the spongy portion, are the better methods.

That strictures in the spongy portion, in consequence of their painful character, do not well bear treatment by gradual dilatation, particularly if the case is one of long standing.

In the cases which we have presented we see well exhibited some of the complications met with in the treatment of stricture, such as urethral fever and hemorrhage.

One case illustrates well the treatment of stricture of large calibre by means of the dilating urethrotome.

ART. XI.—*Cases of Penetrating Wound of the Abdomen and Chest, with Remarks upon the Treatment of such Injuries.* By JAMES C. REA, M.D., Resident Physician to the Episcopal Hospital, Philadelphia.

CASE I. *Penetrating Wound of Abdomen, with Protrusion of Omentum.*—M. E., a young married woman, was admitted to the Episcopal Hospital about 1 A. M. of January 4, 1874, having been stabbed in the abdomen by her husband some three hours previously. The wound was situated on the left side, just above the anterior superior spinous process of the ilium, and extended about one and a half inches from this point upwards and outwards; the omentum had protruded when the patient fell after the wound was received, and, when she entered the hospital, projected in a mass the size of the fist, and was somewhat congested, though there had been no bleeding from its surface. An attempt was immediately made to return the protrusion by gentle manipulation, with the patient lying on her right side, but without success. Cloths moistened with tepid water were then placed over the wound, and half a grain of morphia given by the mouth. The patient was allowed milk as desired, and kept fully under the influence of morphia. Twelve hours after the receipt of the injury, the attending surgeon, Dr. John Ashhurst, Jr., passed two ligatures of strong hempen cord through the centre of the pedicle of the protruding mass, one-quarter of an inch from the line of the wound, tying each ligature separately so as to strangulate the part in two halves. The ligated portion was then cut off half an inch beyond the ligatures, and the pedicle secured beneath the skin and superficial tissues of the wound, the wound itself being closed with silver sutures and dressed with lint soaked in olive oil. The patient was given milk exclusively for diet, and a pill of calomel gr. $\frac{1}{6}$, with pulv. opii gr. $\frac{1}{4}$ every three hours; in the evening there was some pain, localized about the seat of injury, but no symptoms of diffused peritonitis.

Jan. 5. Had several evacuations during the night, but slept well in the intervals; tongue slightly coated, and patient somewhat feverish; changed

the pill of calomel and opium powder to calomel gr. $\frac{1}{6}$; Dover's powder gr. iij, every three hours. Pulse A. M. and P. M. 100.

6th. Renewed the dressing; the wound looking well; considerable induration in the vicinity of the wound from local changes in the peritoneum; pulse A. M. 98, P. M. 104; gave f3j whiskey every six hours in milk.

7th. Tongue cleaning; patient takes milk freely; gave in place of calomel and opium pill of 6th, quiniæ sulph. gr. ij, with pulv. opii gr. ss four times daily, and tr. ferri chlor. gtt. xx t. d.; patient has a desire for food, and is allowed farina and beef-tea.

8th. Wound looks well; patient in good condition.

10th. The induration about the injury has gradually increased until it presents a tumour in the abdomen the size of an orange, very hard and unyielding to the touch; allowed soup and broiled beef.

12th. Ligatures came away leaving a sinus one inch deep; the wound contracting.

15th. Gave quiniæ sulph. gr. 12 in the day in place of the pill of quinia and opium of 7th.

22d. For several days patient has complained of pain in the limb of the injured side with hyperæsthesia of its entire surface; noticed for the first time œdema of the leg with some knotting of the veins, apparently due to pressure of the mass of lymph on the recurrent vessels, and resembling in every respect the milk leg of pregnancy; bathing with a liniment of chloroform and tincture of aconite for a few days relieved the pain, and the other symptoms gradually subsided.

27th. Reduced whiskey to two fluidounces in the course of the day; takes house diet.

Feb. 18. Wound entirely healed and patient allowed to move about the ward in a wheel chair.

22d. The œdema of the leg with pain and knotting of veins has returned; patient ordered to be put to bed, and friction with liniment applied, as in the previous attack.

March 2. Patient discharged; able to walk short distances, but there is a tendency to œdema on exertion of any kind in the erect posture.

CASE II. *Penetrating Wound of Chest, with Pneumothorax and marked Emphysema.*—A. E., husband of the subject of Case I., admitted January 4, 1874, with a self-inflicted penetrating wound of the chest on the left side between the fourth and fifth ribs, one inch outside the mammary line. When first examined there was considerable emphysema of the walls of the chest, with pneumothorax; the emphysema afterwards extended until the whole side from the clavicle to near the hip became implicated. The wound was about one inch in length, cleanly cut, and was closed with one silver suture, and fine gauze and collodion, with a firm compress of dry lint. There was no evidence of the lung having been injured, no severe pleuritic pain at any time, nor any effusion into the pleural cavity. For the first few days the patient complained of slight pain on deep inspiration. His diet was limited to milk alone, and he was given a pill of calomel gr. ss, opii pulv. gr. $\frac{1}{4}$, every four hours. On the morning of January 5 his tongue was slightly coated; mouth and fauces dry; pulse 68; patient drinks milk in large quantities.

Jan. 7. The emphysema diminishing; stopped the pill of opium and calomel.

10th. Wound healed; emphysema entirely gone, and the vesicular murmur, which at first could hardly be distinguished, is now returning to the

lung on the injured side; the pneumothorax is also lessening every day; given house diet.

19th. Discharged, able to walk about without inconvenience; the lung sounds almost normal; one month after was reported as being entirely well.

CASE III. *Penetrating Wound of Chest; Pneumothorax.*—W. G., labourer, aged 21, admitted March 1, 1874, with three punctured wounds of the chest, situated just under the nipple of the left side; the wounds, each half an inch in length, had been inflicted with a pocket knife. Patient had also a flesh wound in the left arm. He was brought to the hospital immediately, reaching it probably twenty minutes after receiving the injury; there was then pneumothorax, and the lung sounds were much diminished in strength; the movement of the chest on the injured side was also laboured and somewhat painful. After closing the wounds with adhesive strips and compresses of dry lint, the injured side was immovably fixed with broad bands of adhesive plaster, as in cases of fractured ribs; this gave much relief and entirely eased the pain in respiration. Patient was then allowed milk as desired, and given opium gr. $\frac{1}{4}$, with calomel gr. ss, every four hours.

March 2. Tongue coated but moist: some pain in lower part of chest, no pleuritic rales or symptoms of effusion.

4th. Tongue cleaning; no pain in chest; allowed some beef-tea and corn starch; opium and calomel pill every six hours.

5th. Pneumothorax diminished; murmur returning in the lung; allowed bread.

7th. Patient allowed to get up; has a good appetite; stopped the opium and mercury pill; given house diet.

10th. Removed the adhesive strips for the first time; no pain on full inspiration; vesicular murmur still somewhat suppressed.

16th. Discharged cured; respiratory sounds normal, and the movements of the chest symmetrical and unaccompanied by pain.

Remarks.—These cases, apart from their intrinsic interest as examples of recovery from severe injuries, seem worthy of record as bearing upon the vexed question of the *constitutional treatment* to be adopted in the management of penetrating wounds of the great cavities. In the first place, it will be observed that in none of the cases was *blood-letting*, either general or local, found necessary. Secondly, what is called *absolute diet* was not prescribed in any instance, but on the contrary the patients were encouraged from the very beginning to take as much milk as possible, and in the course of a few days were given beef-tea in addition, while in Case I. the use of alcoholic stimulus was resorted to at an early period. Thirdly, *opium* was freely administered in all the cases, combined at first with small doses of *calomel* with a view of obtaining what may be called the anticipatory antiphlogistic effect of this remedy; of course had the bowel been wounded in Case I. mercury would not have been given, for fear of increasing the risk of fecal extravasation, but it is believed that this drug exercises a salutary influence upon the reparative process in wounds of serous membranes. *Quinia* and *iron* were given in large doses during convalescence in Case I. Finally, attention is invited to these cases as

illustrations of the benefit to be derived from the *restorative method* in wounds of the thoracic and abdominal cavities—a method which it is believed is destined to win as much favour in surgical as it has already in medical practice.

ART. XII.—*A Case of Lumbar Colotomy for Obstruction of the Rectum by Cancerous Tumours of the Womb.* By JOHN H. PACKARD, M.D., one of the Surgeons to the Episcopal Hospital, Philadelphia.

MRS. H., æt. 49, was seen by me, with Dr. J. M. Boisnot, February 4, 1874. She had been for about a year under homœopathic treatment on account of uterine trouble; and although her sufferings had steadily increased, the physicians had told her that she had no serious disease, and held out constant hopes of recovery. On examination, we found a very abundant cancerous deposit occupying the vaginal walls, bleeding freely at the slightest touch. The uterus was the seat of a massive tumour, so large as to encroach upon the calibre of the rectum, and to produce, by mechanical interference with the passage of feces, the most intense distress. As this last-named symptom was the chief source of her suffering, lumbar colotomy was advised, merely as a palliative. She was fully informed that the operation would probably not prolong her life, and that it might possibly shorten it; but she and her family were anxious to have the chance of temporary relief thus offered.

The operation was accordingly performed, February 7, in presence of Drs. Gross and Levis, and Mr. Vogler, a student with Dr. Boisnot. Ether having been administered to complete anæsthesia, an incision about four inches long was made, slightly curving outwards and downwards from the upper and outer corner of the left quadratus lumborum muscle. The underlying tissues were successively divided on a grooved director to nearly the same extent, until the layer of fat was reached which concealed the gut. This latter was rendered somewhat more difficult to find and identify, from the fact that the patient had for some time been afraid to eat more than just enough to sustain life; and from the mechanical conditions of the case, preventing the artificial distention of the bowel by throwing in either air or liquid. It was, however, booked up with the finger, and caught with forceps, when two hempen threads were passed through its walls. An opening about an inch long was now made in it, and the edges at once turned over and secured to those of the skin-wound by eight or ten sutures of fine silver wire. For a day or two the wound was somewhat painful; it was dressed with a weak solution of carbolic acid. The bowels were moved through it a few hours after the operation, and subsequently about every forty-eight hours. Some nausea and vomiting occurred as the effects of the anæsthetic passed off, but were controlled by means of ice and carbonic acid water. A slight tendency to protrusion of the bowel at the artificial anus was readily overcome by the use of a compress and bandage.

At the present time, fifteen weeks since the operation, Mrs. H. remains quite comfortable; her only suffering is from the original disease, which has, of course, steadily progressed. A day or two ago she took

quite a long drive, with no other inconvenience than that due to the jolting of the carriage. There is not now, nor has there ever been, any unpleasant odour from the fecal discharges, which are readily obtained at intervals of from twenty-four to forty-eight hours. There is sometimes some annoyance from the accumulation of feces in the cul-de-sac formed by the gut below the lumbar opening; but it is not serious, and is generally overcome by the use of enemata.

It certainly seems strange that obstruction of the bowel should be so rarely produced by uterine tumours, in view of the great frequency of the latter. Mr. Hawkins, in the table of forty-eight cases appended to his admirable paper on Colotomy, in vol. xxxv. of the *Medico-Chirurgical Transactions*, mentions one (No. 41) in which colotomy was rendered necessary by cancer of the womb, there being also an adhesion of the ileum to this organ; and one (No. 47) in which the bowel was obstructed by fibrous tumours of the uterus. In the former case death ensued in twelve hours, while in the latter it was postponed eighteen days, and then took place from sloughing of the wound. Dr. Erskine Mason, in his valuable and exhaustive article in the number of this Journal for October, 1873, has also given an account of one case in which the uterus, rectum, and vagina were involved in cancerous disease, causing obstruction of the bowel, for which colotomy was performed. Death occurred three months afterwards from exhaustion. Besides this case, there is in his table another (No. 68) in which the rectum was occluded by cancer extending from the uterus, and the operation gave relief, death occurring from peritonitis four months and five days afterwards.

In the same volume of the *Med.-Chir. Transactions* with the paper of Mr. Hawkins, above quoted, there is a table of one hundred cases of uterine cancer, by Dr. Robert Lee; among these there were six in which perforation of the wall of the rectum is noted to have occurred, but none in which obstruction of the gut is mentioned. This latter symptom is indeed hinted at as among the possible results of cancer of the womb, by Walshe, Simpson, and others; but it cannot be so frequently met with as might, *à priori*, be supposed, or it would be more dwelt upon, and the means of its relief distinctly pointed out. When, however, obstruction of the bowel does occur, the symptoms are so distressing, and the agony by which life is worn out is so lingering and painful, that the advantage of colotomy can hardly be over-estimated. Of this the case I have reported seems to afford a striking instance. The attention recently drawn to this operation may warrant me in adding a few remarks upon the subject.

It can hardly be expected that this procedure can ever be looked upon, in the great majority of cases requiring it, as anything but a palliative. A case is indeed on record in which it was done for the relief of fistula in ano, and the patient recovered, the fistulous openings healing, and the artificial anus also becoming closed. Either the reporter of this case, M. Dufresne, in communicating it to the Académie de Médecine, in Au-

gust, 1844, or the correspondent of the *Medical Times* (vol. x. p. 446) remarks: "This case, which has no precedent in its favour, may astonish some persons, and the operation be considered as not indicated. All that can be said is, that Duguesceau's talent was sufficient to enable him to form an opinion as to the absolute necessity of the operation ere he performed it." It certainly seems as if the remedy were rather a heroic one for any ordinary case of anal fistula. Another case is mentioned in the same report, in which colotomy was performed on a man "whose abdomen had been penetrated by a cart-stake." Here, also, in the absence of further detail, it is somewhat difficult to imagine what the symptoms may have been which led the surgeon to open the colon. We are told that in this instance, in 1793, the operation "had succeeded;" but whether this means that the artificial opening ultimately closed, leaving the patient in his original state of health, or merely that life was prolonged, does not appear.

Whether the operation of colotomy is merely palliative, or may afford a chance of radical cure, must depend, in every case, upon the curability of the disease for which it is proposed. Thus there are perhaps some strictures of the rectum, not cancerous in their nature, in which the affording of a temporary artificial outlet for the feces may render it possible to apply other remedial measures with a happier effect; but the question would arise whether the advantage thus gained would really be worth the trouble and inconvenience the operation must entail.

In the case of children with imperforate anus, not penetrable by the usual operation, it certainly seems as if for them death were preferable to the chance of bearing about, from infancy to old age, the burden of an infirmity so mortifying, and so disqualifying from all the enjoyments of childhood and youth, as that of an artificial anus in the loin or groin. And yet the moral question arises, whether it is not the first duty of the surgeon to preserve life, at the earliest as well as at the latest period? And it would surely be a wrong for him to decide such a point without laying all the facts of the case before the parents, and at least letting the onus of its solution rest on them. With adults it is far different; and the operation may be urged strenuously in view of the great value of the merely palliative advantages it affords.

One or two points may be referred to, finally, as to the performance of the operation.

The oblique incision seems to me to offer great advantages over either the vertical or the transverse; it affords more room to work in than the former, especially where the space between the last rib and the crista ilii is limited; and it is more easily kept closed than the transverse—at least if, in the latter, any of the fibres of the quadratus lumborum muscle are divided.

The rule given by Allingham and others, to divide the deeper layers of

tissue to the same extent as the outer, lest the operator find himself working at the bottom of a conical hole, is a very important one. It must be remembered that the operation is undertaken in order to afford a free exit to the contents of the bowel; and this will not be accomplished if the deeper structures are insufficiently divided. Nor is anything gained by limiting the extent of the deeper sections, since there is no additional control gained thereby over the evacuation of liquid feces, while the difficulty of getting rid of any solid masses is much increased. And, by parity of reasoning, the incision through the wall of the bowel should be of ample size—an inch at least; this makes the securing of the edges to those of the wound in the skin much easier, and does not add to the risk of protrusion of the bowel.

An adequate number of silver wire sutures should be used to insure the complete contact of the everted wall of the gut with the skin; and these sutures need not be disturbed for weeks, unless they give rise to distinct annoyance by the twisted ends irritating the tissues.

1926 SPRUCE STREET, May, 1874.

ART. XIII.—*Alcoholism, Rheumatism, Bromo-iodism, Cerebral Embolism* (?), *Aphasia, Paralysis; Recovery.* By A. F. A. KING, M.D., one of the Physicians to Providence Hospital, Washington, D. C., etc.

HENRY W., labourer, aged 50, entered Providence Hospital November 18th, 1873. My annual period of attendance in the Institution beginning December 1st, I did not see the patient till that time. By reference to the record, however, I found his disease had been registered "alcoholism," but his indulgence in drink had been limited and transient. Not by any means a drunkard or "old toper," he had been intoxicated only a few days, and from careless exposure during that time had contracted rheumatism, which at the date of my first attendance was his chief complaint. He had been the victim of rheumatic inflammation on former occasions, but there was no history of cardiac complication, *nor could any physical signs of heart disease be discovered* on the most careful examination with Cammann's stethoscope, and none have been since developed. Bowels habitually constipated. Ankles swollen and painful, as were also the fingers, knuckles, and metacarpo-phalangeal joints, especially on the right hand. Ordered: R.—Ammon. bromid. \mathfrak{z} ss; aq. camph. \mathfrak{z} v; syr. g. acaciæ, \mathfrak{z} ij; morph. sulph. gr. j.—M. Sig.—Tablespoonful three times a day.

Dec. 18. Has continued medicine, with occasional doses of castor oil, without much benefit. Stop bromide mixture and take potass. iodid. \mathfrak{z} ij; aq. camph. \mathfrak{z} ij.—M. Sig.—Teaspoonful three times a day. R. Pulv. Doveri, gr. x at night. Painful joints painted with tinct. iodine.

24th. Rheumatic inflammation a little improved. Gums, mouth, and inside of cheeks sore; increased flow of saliva. To have mouth wash of alum and tr. myrrh. Dose of castor oil. Stop other medicines.

30th. Sore mouth getting better. Rheumatism about the same. R.—
Vin. colch. sem. gtt. xv, three times a day. Continue mouth wash.
Pulv. Doveri at night.

Jan. 1. Rheumatism rapidly improving. Mouth better. Still continues "wash" and colchicum with occasional anodyne at night.

He has been all along, and still continues in good spirits, without anemia, and takes no stimulants.

8th. Rheumatism getting well fast. Joints but little red or swollen. Can clasp a hand, and clench his own fist without pain.

On being questioned this morning, he was aphasic, answering "I can't," "I can't," but could say nothing else. On repeating questions to him he frowned, scratched his head (on the left side anteriorly, which, however, may have been *accidental*, I mean as to *location*), and set his teeth like a schoolboy puzzling over a sum in arithmetic, and then, rolling his cranium from side to side on the pillow, became agitated and embarrassed, and finally shed tears in a childish manner. On being instructed to nod or shake the head for "Yes" or "No" in response to questions, he did so with perfect intelligence. The mouth was drawn to the left side in so slight a degree as to be almost imperceptible. On protruding the tongue he could not hold it steady, but the organ appeared to move from right to left and *vice versa* with equal facility. Pupils normal and respond to light. He drags the right leg in walking, and there is slight paralysis of the right arm. Sensation in all parts unimpaired. To stop all medicines except castor oil when required.

The heart was again carefully examined, but no signs of disease in it could be discovered.

10th. The aphasic symptoms continue without change. Paralysis, especially of leg, has considerably increased. He cannot walk without assistance. On standing unsupported, with the eyes shut, he cannot balance himself, the tendency to fall being mostly backwards. No other head symptoms; no constitutional disturbance; appetite tolerably good. Frequent micturition during the last two days (but never before) has been his chief complaint. Cannot retain the urine; has also had involuntary evacuations from bowels on one or two occasions. The urine on examination was found to contain an abundant deposit of triple phosphate prisms.

13th. The aphasia is better. He can say a good many more words, but fails in many others. Cannot name articles presented before him although he knows what they are, but when the name is spoken by another he can repeat it indistinctly and with difficulty. Palsy of leg and arm also improving. The right hand and arm have been more painful lately, but there is not much heat or swelling in the affected joints. His last two nights have been restless, and he has repeatedly fallen out of bed.

During the remainder of January and February he gradually regained the use of his palsied limbs as well as the voice. He has been anemic, but takes nothing but good food and iron.

March 1. Left the hospital of his own accord. For the last six weeks he has been steadily improving. The rheumatism is quite gone. He walks without a stick. The paralysis of the right hand, arm, and leg is nearly well, though their *power* is still somewhat impaired. A little "thickness of speech" still remains. The vesical and rectal sphincters have regained their integrity except that when having, as it were, consented to urinate, the water flows before he can get to the closet. The

urine is clear and almost devoid of phosphates. The appetite and digestion are both good, and he is in jolly spirits. No medicine has been given in the last few weeks except tinct. ferri chloridi and occasional doses of castor oil.

Remarks.—Since this case recovered we are (and fortunately) left in doubt as to its exact pathology, and may therefore be allowed to theorize in regard to it. We presume it to have been embolism of the left middle cerebral artery. The embolic body was probably detached from the heart or aorta, and *this* despite the absence of physical signs, for while it is true that organic changes of a certain prodigious degree can be discovered generally by physical examination, it must be admitted that lesser degrees of structural change may altogether escape detection. The embolism we presume was slowly disintegrated by fatty metamorphosis, before any extensive cerebral softening had taken place, though that *some* organic cerebral change had occurred was indicated by the urinary deposit.

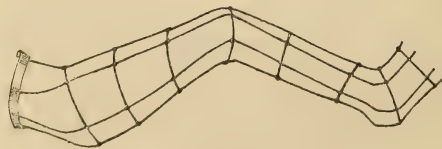
A question of great practical importance is this: Was not the embolism really produced by the medicines employed to relieve rheumatism? In other words, did not the salivation, or the blood changes incident to it, produced by the excess of bromides and iodides, lead to the separation of an embolism that would otherwise have remained securely attached to its seat in the heart or aorta? If the truth could be known, this question, we apprehend, would have to be answered in the affirmative. In the absence of proof we may at least enjoin additional caution while administering these two oft-used haloids for prolonged rheumatic inflammation.

ART. XIV.—*Case of Fracture of the Neck of the Femur treated by a New Apparatus.* By J. C. BISHOP, M.D., of Middleport, Ohio. (With a wood-cut.)

On the evening of March 13th, 1873, I was hastily summoned to Mrs. D., æt. 78; nervo-bilious temperament, well nourished, and vigorous for her age, and obtained the following history of the case:—

About sundown, while walking along a narrow pavement in the outskirts of the village, made by placing narrow boards side by side on short pieces of scantling, which were allowed to project somewhat over an accompanying drain, she struck her foot against some inequality in the pavement, and fell, striking the upper portion of the left thigh against one of the projecting pieces of scantling, and was unable to rise; and when lifted to her feet, was unable to stand or even move the left foot from the ground. She was carried some distance home on a lounge, and, before being placed in bed, made another unsuccessful attempt to stand, the foot hanging uselessly on the floor. At the time of the fall she "felt something give way" at the hip, and from that time experienced intense pain in the hip-joint, extending along the thigh to the knee, *especially*

severe on any attempt to move the injured limb. An examination by comparison with the unaffected side showed *flattening of the trochanter*; measurement indicated from *one to one and a half inches shortening*. There was well-marked *eversion of the foot*, the heel of the injured limb rested above the malleolus of the opposite leg, and slight *crepitus*. Diagnosis: fracture, probably intra-capsular, of the cervix femoris, with, of course, a doubtful prognosis. An anodyne was prescribed, and, with a promise to call on the following morning, I left. Knowing the difficulty in obtaining favourable results in the treatment of this injury when occurring in *aged persons*, on account of the necessary and protracted *confinement to bed in one position*, imposed by the various contrivances recommended, therefore it occurred to me that the long splint of Liston, Physick's modification of Desault's, and Gibson's modification of Hagedorn's, were alike objectionable in this case, because they imposed *too much of this confinement*, while the proceeding recommended by Sir Astley Cooper, of simply supporting the limb on pillows, *demanding too little*. Now, if an apparatus could be devised which would occupy a *middle ground*, and, while it maintained the proper coaptation of the fragments, would permit the necessary movements of the body (the previous robust health of the patient considered), it would at least offer *some chance* for a favourable result. At my next visit I found the patient irritable, despondent, and wearied. She informed me that she had not been able to lie on the back for even a few hours at a time for years, and that she had frequently suffered from attacks of dyspnoea, and palpitations while lying in that position. Here was a positive contra-indication to protracted dorsal confinement; and what exerted no particularly salutary influence mentally, was a knowledge of the fact that a sister had died a few years before from a similar injury. I then made accurate measurement of the size of the hip, thigh, knee, and ankle, with distance from anterior superior spinous process of ilium to the knee and foot, and constructed a *splint of wire*, slightly larger than the measurement, to conform to the shape of the hip and limb throughout, which would retain the knee flexed at an angle of about 45° . This wire splint was so fashioned as to envelop the outer surface of the hip and limb, so that, when applied, it should cover slightly more than half the circumference of the leg, and, extending to the waist, it could be firmly fastened there, while, at its distal extremity, the foot would be retained in its natural position. This "splint" was composed of (see figure) four small wires,



about the size of a No. 10 bougie, bent in the shape desired, and placed longitudinally, and supported by circular wires of the same size, placed transversely at a distance of from four to six inches from each other, and soldered firmly to the crossings of the longitudinal wires, while the latter, at their upper extremity, were in turn as firmly soldered to a tin band one and one-half inches in width. The inner surface of this splint was covered first with a single layer of muslin, then well padded with raw cotton, and over this another layer of muslin, which was so fastened as to retain the

cotton and first layer of muslin in place. Into this the entire limb was placed after securing the necessary apposition of the ends of the bones, and secured by application of the roller, so as to equalize the circulation by rendering an equal pressure throughout. The upper end was firmly secured around the waist by a broad padded bandage, while the lower end held the foot. The wire was kept in place for six weeks before its removal, although, after the first few days, broad bands of muslin were substituted for the roller. After the sixth week it was removed for a short time daily, the time being gradually extended, until the eighth week it was left off entirely, and passive motion instituted; and to-day, slightly more than one year from the date of the injury, this aged lady walks without the assistance of a cane even up and down stairs, almost as sprightly as before the accident, with only a perceptible limp, the result of less than one-half inch of shortening. During the progress of the case the patient was enabled to change her position so frequently that she was almost entirely free from that distressing complication—"bed-sores," only one of which made its appearance, and that on the natis of the right side, and which yielded kindly to a few applications of calomel alone. No other untoward symptoms were manifest during the entire time to the period of recovery.

It will be seen that the position of the limb, as maintained by this apparatus, is after the manner of the "double-inclined plane," with slight extension and counter-extension; the upper extremity fastened around the waist, acting as the counter-extending force, while the foot, confined to the foot-piece of the wire, together with the flexed position of the knee, is sufficient extending force. The author claims that this apparatus, in the treatment of fractures of the neck of the femur, gives perfect rest to the part, and at the same time a certain freedom of movement of the rest of the body, which is no less essential, and, under protracted confinement, much less irksome than when treated by the ordinary appliances. It will not be denied that absolute confinement on the back, especially in aged patients, has been a fruitful source of mortality, and caused many a failure to produce satisfactory results in this class of cases in the hands of some of the most eminent surgeons in Europe and America. Another advantage claimed is, its *lightness* and *firmness*. In ordinary cases the wire used in its construction need not be so heavy as those used in the construction of my splint, and at the same time sufficient firmness may be secured. As it is, it is even lighter than any of the splints constructed of wood with which I am acquainted. Again, the padding may be of such material and so light as to permit perfect ventilation through it, thus supplying an essential element to the integrity of the limb, which is prevented by the great majority of the appliances now in use. I am not aware that any precisely similar instrument has ever been employed in this class of cases; and I would earnestly recommend it to the notice of the profession, with the assurance that it will be found to fulfil the indications in the treatment of fractures, not of intra-capsular alone, but in those occurring without the capsule, in both aged persons and in the younger subjects as well. The excellent result afforded in this very unpromising case I have no doubt is due wholly

to the apparatus by keeping the joint at perfect rest, while great freedom of movement of the body was permitted; and that it will act equally as well in the future I am well satisfied.

April 9, 1874.

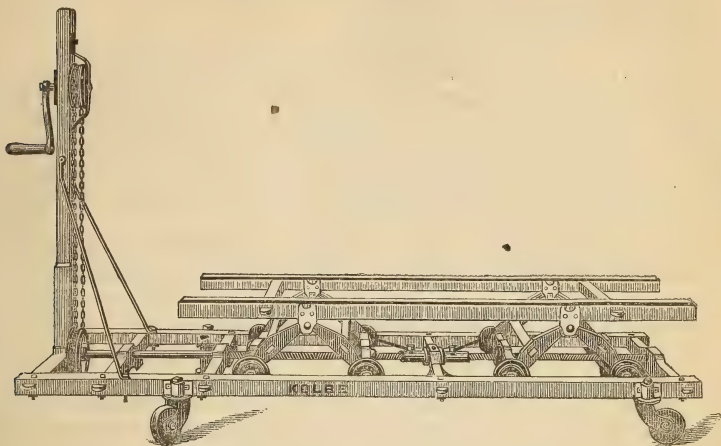
ART. XV.—*Description of a Hospital Bed-Elevator and Carriage, designed especially for Surgical Wards.* By THOMAS G. MORTON, M.D., Surgeon to Pennsylvania Hospital, and Emeritus Surgeon to Wills (Ophthalmic) Hospital. (With a wood-cut.)

THE transfer of surgical or medical cases without discomfort to the patient, from ward to ward or to and from the amphitheatre for clinical demonstration, operation, or otherwise, has, for a long time, been a matter of considerable interest to me; and I have, with others, for years past thought that some contrivance might be devised to move serious or suffering cases.

The transfer of patients in bed for cleaning a ward, or for any other purpose, requires, in most cases at least, three and often four assistants, and when the patient is upon a water-bed it is found impossible, unless the water is first emptied. All hospital surgeons must have observed how often patients, with serious and painful diseases, have suffered intensely at times from the jarring incident to their removal to the lecture-room or from ward to ward; more frequently the convalescents in a surgical ward are detailed for the work, or at least to assist, and generally but little care is bestowed on the careful carriage of the sufferer. For these reasons, some two or more years ago, it occurred to me that a truck might be constructed with an elevating apparatus so arranged that, after being pushed underneath a bed, it could then be made to lift both bed and patient from the ground, while, the apparatus being on wheels, transportation could be easy and without shock or jarring.

With the assistance of Mr. R. F. Shreiner, the apparatus, which is shown in the accompanying figure, was devised and placed in successful operation. It was made in the spring of 1872, and was on exhibition at the College of Physicians at the time of the meeting of the American Medical Association in Philadelphia, in May of that year, and since that time has been in constant daily use at the Pennsylvania Hospital, where it has been found indispensable. The apparatus can be readily manipulated by one person, although two can move it about more comfortably. When in the clinic room the patient upon his bed can, with ease, be moved in various directions for class demonstration without discomfort to the patient or annoyance to the lecturer.

The apparatus consists, as will be seen by a reference to the wood-cut, of a double truck, the upper one elevated by a series of cams which run



upon a narrow iron track ; a long right and left screw, worked by an endless chain upon a crank at one end raises and depresses the cams. The apparatus is made of oak, and the hinges of brass, the wheels are supported by steel pins. By experiment it has been found that four hundred pounds can be lifted quite free from the floor in four seconds, and without difficulty a water-bed, which weighs about seven hundred pounds, with patient, can be elevated and readily moved. The elevation of the bed an inch from the ground is all that is required. The apparatus, if properly made, will not readily get out of order ; the first one placed in the Pennsylvania Hospital remained in good working order, without repair, nearly two years, since then a second has been required, and has been found to work very satisfactorily, and is essentially labour-saving.

Such an apparatus would have been of very great service in our army hospitals, especially those constructed after the plan of the Mower Hospital, at Chestnut Hill, Philadelphia, where the wards, some forty-eight or more in number, all diverged from a circle upon the same level.

The apparatus measures six feet five inches in length by two feet five and one-half inches in width ; it can thus be readily passed under our beds at the Pennsylvania Hospital, which measure six feet five inches in length by two feet six and one-half inches in width, and are one foot three and a half inches in the clear from the floor to the under surface of the bed. Some slight variation in the construction of the apparatus would be required in order to suit the different forms of hospital beds ; but, as a rule, most of these have the same general size and make up. The adaptation of a lever instead of the screw movement has been suggested, but so far, I have not been able to apply the elevating power by this method.

ART XVI.—*Sulphate of Zinc in the Treatment of Poisoning by Rhus Toxicodendron and R. Radicans*. By CHARLES H. HUMPHREYS, M.D., of Brandt, Miami Co., Ohio.

SEVERAL articles having of late appeared in this Journal relative to the treatment of poisoning by *rhus toxicodendron* and *R. radicans*, without mention being made of the use of the sulphate of zinc in the treatment of such cases, I deem it my duty to call attention to the efficacy of that salt as an application in such cases. The use of that drug was suggested to me some years since, and, after trying it, I have since used no other remedy, as it afforded speedy and certain relief.

The usual form in which I use the sulphate is in solution in water, about ʒss to aq. Oj, and direct the patient to bathe the part affected frequently.

In every case (some twelve or fourteen in all) in which I have used the remedy the vesicles and inflammation rapidly disappeared, desquamation of the skin commencing usually in less than forty-eight hours from the first application of the lotion, and frequently a decided change occurring in twenty-four hours. I now never use any other application—as the patients assert that it gives speedy relief to the itching and burning.

My last case was that of a young man, æt. 16, who has always been susceptible to the subtle influences of the *rhus*, “getting poisoned if he only *looked* at his enemy,” as he expressed it. Both hands and wrists were inflamed, and enormously swollen. In urinating he conveyed the poison to his penis, affecting the whole organ, and the scrotum, the lower part of the abdomen, and part of the thighs. The prepuce was swollen to the size of a common orange and distended with fluid, giving it almost a transparent appearance; there was phimosis, completely hiding from view the glans; the scrotum was enormously swollen. I was sorely tempted to puncture the prepuce, but decided to try the zinc, which produced absorption of the fluid in thirty-six hours, and in forty-eight hours the skin was rapidly desiccating, and in a few days all traces of the disease had disappeared.

Some weeks ago I was asked to visit a man about 40 years of age, poisoned with *rhus*. I found him delirious, and with considerable fever; pulse 110, tongue thickly coated, bowels constipated. Upon the face was an eruption of an erysipélatous nature, and from the amount of constitutional disturbance I was led to believe it a case of facial erysipelas, until informed by my patient’s wife that a few days previous, while in the woods, he had come in contact with poison-oak, and upon returning home remarked that he would again be poisoned, that it shortly did make its appearance, first upon the nose, thence spreading over the cheeks and eyes. The inflammation had extended over the forehead and into the scalp, both eyes were quite closed, both ears, cheeks, and lips were very much tumefied and pitted on pressure, and the patient’s features were so much disfigured that he was not at all recognizable.

I gave him a free purge, and zinc. sulph. ʒj in aqua Oiss to sponge his face with every hour during the day and a few times through the night. In two days I found my patient walking about the house, and “feeling quite well.” The œdema about his eyes had nearly disappeared, and desquamation of the epidermis from his face was proceeding in the usual manner.

The foregoing cases, with others, could be related more fully did I think the detailed histories of the cases called for.

REVIEWS.

ART. XVII.—*A Practical Treatise on the Surgical Diseases of the Genito-Urinary Organs, including Syphilis. Designed as a Manual for Students and Practitioners. With Engravings and Cases.* By W. H. VAN BUREN, A.M., M.D., Professor of the Principles of Surgery, with Diseases of the Genito-Urinary System and Clinical Surgery, in Bellevue Hospital Medical College, etc., and E. E. KEYES, A.M., M.D., Professor of Dermatology in Bellevue Hospital Medical College, etc. 8vo. pp. xvi., 672. New York: D. Appleton & Company, 1874.

THE high reputation of the authors of this volume, and the position which they claim for it in their preface, make it incumbent on the reviewer to examine the work with more than ordinary care, and to judge it by a higher standard than would be employed in dealing with the production of an obscurer writer, or with a book of less ambitious aim.

Referring to the tendency observed in all large communities for the practice of medicine to become subdivided into special departments, and to the facilities for clinical study afforded by large city hospitals, and the opportunities for teaching furnished by the establishment of medical schools, the authors add that cities are "the natural repositories of accumulating experience and the sources of advancing knowledge.

"It is from city practice and hospital experience, therefore," they go on to say, "that the materials for the preparation of text-books on special subjects would be naturally sought, and from these sources the substance of the present work has been mainly derived. Its object is to present to the student and general practitioner a succinct account of the nature and treatment of the diseases incident to the genito-urinary organs as they are encountered in private and hospital practice by those engaged in their daily and especial study. The literature of this department of surgery has been exhaustively studied with the purpose of reproducing every fact of practical value. It is hoped that the reader will recognize a conciseness in the grouping of these facts which will save him the necessity of reference to the numerous monographs and essays from which they have been collected."

It will thus be perceived that the authors professedly speak *ex cathedra*; they, as specialists, undertake to convey, in the volume before us, information which they have had special opportunities of acquiring, to their less-favoured brethren; and they not only communicate the results of their personal experience, but they claim, moreover, to have exhaustively studied the literature of their subject, and to have condensed in their work all that is worth knowing in regard to the diverse and intricate subjects of which they treat.

Before entering upon a detailed examination of their pages, let us say at once that, even when judged by the high standard which they themselves have set up, the authors' work impresses us as one of much merit, and as one which, upon the whole, satisfactorily fulfils its design. As a practical work it is, we think, particularly deserving of commendation; it covers more ground than any similar volume in our language with which we are acquainted, and its teachings upon almost all subjects are such as must be

approved by every judicious surgeon. Upon some few points we venture to think that the authors convey erroneous doctrine; but the very fact that upon these points such diverse views are entertained by equally competent authorities, shows that surgeons are still far from having acquired certainty upon these matters, and that with regard to disputed questions it is often safer to be undecided than dogmatical.

As to the encyclopediacal character claimed for the work, while we admit that the authors' reading has evidently been wide and profitable, we should hardly call it *exhaustive*; this epithet is, indeed, rather a large one, and in the present era of prolific authorship can seldom be applied with justice. In one respect the work is, we think, decidedly amenable to criticism; this is that the authors' excursions amid the *prata jucunda* of surgical literature seem to have begun and ended on the other side of the Atlantic: indeed the ingenuous student, or the inquiring general practitioner, who should rely exclusively upon Drs. Van Buren and Keyes's treatise, would inevitably infer that, apart from the authors, America had produced but a dozen or so surgeons living in New York, and a much smaller number sparsely planted over the rest of our wide country. We have no sympathy with that provincial spirit which regards American as better than European work, simply because it is American; but on the other hand we maintain that the work of our own countrymen is certainly no worse than that of foreigners, and that in a volume designed as a text-book for American students it should receive at least a share of attention. As an illustration of what has been said we may mention that among the hundreds of references in the foot-notes, including very many to English, French and German journals, we have been able to find but one to any article in the *American Journal of the Medical Sciences*, and that reference so indefinite that we cannot resist the suspicion that it has been taken at second-hand from Dr. Bumstead; but we know that this Journal has, during its forty-seven years of existence, contained papers, by writers in all parts of our country, which are of interest and value to students of genito-urinary surgery, and which, in our opinion at least, the authors might have advantageously consulted in the preparation of their work.

Leaving this subject we shall now invite attention to the general plan and execution of the book, and afterwards to such points as seem to us to call for special comment. The whole work is divided into two parts, the first treating of "Diseases of the Genito-Urinary Organs," and the second being devoted to the consideration of "Chancroid and Syphilis." The *first* part consists of twenty-eight chapters, and takes up successively Diseases of the Penis, Diseases of the Urethra (including Gonorrhœa and its complications, and Urethral Stricture), Diseases of the Prostate, Diseases of the Bladder, Vesical Calculus and its treatment by Lithotripsy and Lithotomy, Diseases of the Ureter, Diseases of the Kidney, Diseases of the Scrotum, Diseases of the Testicle, Maladies involving the Genital Function, Diseases of the Cord, and Diseases of the Vas Deferens and Seminal Vesicle. The *second*, and shorter part, contains thirteen chapters, two of which are devoted to Chancroid, and the remainder to Syphilis; the chapter on Syphilitic Diseases of the Eye, as we learn from the preface, has been entirely furnished by Dr. H. D. Noyes, and the authors acknowledge their indebtedness to Dr. Roosa for aid in the preparation of the chapter on Syphilitic Diseases of the Ear.

In Chapter I. are described the various affections met with in the penis, excluding those which involve the urethra. Wounds, contusions, and

so-called fractures of the penis are briefly considered, as are the various forms of tumour met with in this organ, and diseases of the prepuce and glans, including phimosis, paraphimosis, balanitis, vegetations, etc. In the account of the operation of circumcision, nothing is said about the use of fenestrated forceps for the preliminary introduction of sutures, and the instrument figured in the accompanying illustration is unfenestrated, though dubbed with Ricord's name; but the peculiarity of Ricord's instrument, according to Guérin and other systematic writers, consisted precisely in its being fenestrated instead of plain; it is but right to add that Ricord is said by Guérin to have subsequently abandoned the use of the suture altogether in this operation in favour of the *serre-fine*.

Chapter II. opens with an account of the anatomy of the urethra, and a description of the operation of catheterization. The proper curve for urethral instruments was carefully studied many years ago by Dr. Van Buren, by means of ingeniously planned experiments carried out in conjunction with the late Dr. Isaacs, and was ascertained to be the same as that recommended by Sir Henry Thompson, in his well-known work on stricture, and which is now commonly spoken of as the "Thompson curve." Deformities of the urethra, including hypospadias and epispadias, are briefly described, and in connection with the former, Bouisson's operation for incurvation of the penis is referred to; but no mention is made of the ingenious modes of treatment advocated respectively by Mr. Holmes, of London, and by Prof. Pancoast, of this city. Two pages are devoted in this chapter to the subject of "*Urethral and Sexual Hygiene*," and frequent references to the same occur in various parts of the book; the author's views upon these delicate topics seem to us eminently just and practical, and their instructions upon these points might be profitably studied by all medical men. In one particular they seem to us, however, to have gone rather too far, and that is in the freedom, not to say looseness, with which they have prescribed wedlock for all forms of sexual discomfort; apart from the moral side of the question, and the fact that the happiness of the innocent bride should be at least as much considered as that of the repenting sinner who proposes to seek health in matrimony; we greatly doubt whether marriage entered into simply as a means of cure, often proves efficient in conferring the benefits which are sought from it.

In speaking of *contusions of the urethra* (ruptured urethra), the authors say:—

"If the patient can pass water, and there is no infiltration of urine, no attempt should be made to introduce an instrument into the bladder immediately after contusion of the urethra, for fear of making a false passage at the injured point of the canal."

This we believe to be unsafe teaching; with care, a flexible catheter can almost always be passed in these cases, and the patient is, we think, much less exposed to the risk of urinary extravasation if a catheter is promptly introduced and kept in, than if he is permitted to attempt to pass water without the aid of an instrument. Failing to pass a catheter, the surgeon should, we think, at once lay open the urethra from the perineum. Upon this subject our readers may advantageously consult an interesting case reported by Dr. T. F. Betton in the number of this Journal for February 1837, p. 389, with an appendix by the editor, giving the details of a number of cases of a similar character.

A few pages are devoted in this chapter to the curious affection known as *Urethral or Urinary Fever*, and the subject is again adverted to in

one of the chapters on Lithotrity. The authors do not seem to us to have thrown any new light upon the pathology of this disease, and, while recognizing in some cases a septicæmic or pyæmic condition, and in others one of uræmia, fall back upon our old friends "shock and reflex action," as being the cause of the symptoms in most instances. We have so often in these pages discussed the pathology of urethral fever and its congener gonorrhœal rheumatism, and given our reasons for believing that both are closely analogous to, if not actually mild forms of, pyæmia, that we need not revert to the question at this time, further than to say that the terms "vague suspicion" (p. 81), "vague opinions" (p. 321), and "vague ideas" (p. 322), by which the authors characterize the views of those who think as we do, seem to us much more applicable to the doctrines of "shock and reflex action" (pp. 46, 47), and "idiosyncrasy" (p. 81), which they themselves advance. We cannot but admire the *naïveté* with which Dr. Keyes tells in a foot-note (p. 46) how he has experimentally practised hypodermic injections of *urine* in the unsuspecting patients of the Charity Hospital—an observation *in corpore vili* with which he is so much pleased that he narrates it over again on page 144, adding that the patients ingenuously supposed that they were receiving injections of morphia.

This chapter ends with an account of *Foreign Bodies in the Urethra*, for the removal of which, when long and soft (as a bit of catheter or stick), a little operation is recommended which we do not remember to have seen previously described, and which is certainly ingenious and worthy of trial; this consists in transfixing the foreign body with a stout needle passed through the floor of the urethra, and pushing back the canal as far as possible, like a glove over a finger, then withdrawing the needle and transfixing again, and so gradually coaxing the foreign body forwards until it can be seized at the meatus.

Chapter III. is devoted to a consideration of *Gonorrhœa*, which the authors in common with most modern writers describe as being simply a virulent *urethritis*, though they think it desirable for practical purposes to retain both names, and to apply the latter to all cases of doubtful origin. In the treatment of gonorrhœa the authors attribute more value to internal medication than we are disposed to do, and particularly to the administration of copaiba, oil of yellow sandal-wood, and cubebs; although, as our readers know, we follow Abernethy in approving of the "constitutional treatment of local diseases," we have never been able to see the propriety of systematically burdening the alimentary canal with these nauseous remedies in seeking a cure for an affection of the urethra, which can in most instances be so conveniently and so satisfactorily treated by topical means alone. No allusion whatever is made to the use of copaiba by urethral injection, a mode of treatment which we believe originated with Dallas, of Odessa, and which, though no doubt valueless, appears at first sight sufficiently plausible, one would have thought, to have merited mention, even in the way of warning, in such an exhaustive work as this professes to be. In speaking of *deep urethral injections*, the instruments devised by Bumstead and Bigelow are referred to and figured, but no allusion is made to the equally ingenious appliances of Morgan, of Dublin, Durham, of London, and Hewson, of Philadelphia.

In Chapter IV. are considered the complications of gonorrhœa, including gonorrhœal rheumatism, and the two forms of gonorrhœal ophthalmia—the rheumatic and the conjunctival. *Epididymitis*, one of the most troublesome complications of gonorrhœa, is considered in another

part of the book in connection with diseases of the testicle. In the treatment of gonorrhœal conjunctivitis, or (as we prefer to call it) ophthalmic gonorrhœa, the authors advise free, and, if necessary, repeated division of the external canthus, so as to relieve the eye from pressure; and, in the early stage, if the patient be robust, repeated abstraction of blood by leeches or cups, together with irritant purgatives and low diet. We confess that this plan of treatment seems to us rather heroic; we are disposed to think that in a majority of cases the free administration of quinia will prove more truly antiphlogistic than the repeated application of cups. As regards local treatment, the authors justly lay stress upon the importance of cauterization and the enforcement of cleanliness.

Stricture of the Urethra forms the subject of the next four chapters; and this is, upon the whole, one of the most satisfactory portions of the book. The various instruments needed in the management of stricture, and the proper mode of employing each, are carefully described, and no one can read these pages without perceiving that in this department of surgery the authors speak by the card, and teach out of the full knowledge of a large experience. Here we find much to praise and little to criticize. We cannot, indeed, share the authors' preference for metallic over flexible instruments in the treatment of stricture, and are somewhat surprised at their statement that "patients tested, at the same sitting, with soft and steel instruments, almost invariably complain less of the latter;" for our own observation has led us to form a different conclusion. It is but right to add, however, that Drs. Van Buren and Keyes only recommend steel instruments of a size not less than No. 9 of what they call the "American scale," *i. e.*, five millimetres, or about one-fifth of an inch in diameter. The modes of treatment commended by the authors are simple dilatation, rupture, or divulsion, and internal and external urethrotomy. The method of continuous dilatation is but slightly referred to, which we think an error, for we regard it as the next best method to simple dilatation; and, though Arnott's use of fluid pressure is mentioned, no reference is made to the more recent and ingenious mode of employing the same agent advocated by Coze, of Strasbourg; nor to the use of laminaria bougies, as practised by Reeves and Newman. Yet these are modes of treatment the merits or demerits of which should, we think, have been pointed out in a text-book written by specialists upon the subject of their specialty. It could not be expected, perhaps, that all the urethrotomes and divulsors which the ingenuity of surgeons has suggested, should be described; and, indeed, the authors profess to give an account only of "the type instruments of each class." Yet room, we think, might have been advantageously made for a notice of the excellent splitting instrument devised by Richardson, of Dublin; and we should like to see an authoritative condemnation of a certain urethrotome which is found in our cutlers' shops under the name of a learned Professor of Philadelphia. Again, we think some notice should have been taken of the ingenious modifications in the operation of external urethrotomy suggested respectively by Jordan, of Birmingham, and by Mastin, of Mobile; and, in connection with the operations of puncturing the bladder through the rectum and above the pubes, some account should have been given of Brander's method of puncturing through the symphysis, and of Cock's recently revived mode of "tapping the urethra at the apex of the prostate." Still these are, after all, comparatively unimportant defects; and we should not, perhaps, have thought it worth while to notice them but for the authors' assertion that they had exhausted the literature of their subject.

We have been particularly struck by the extent to which the authors push the maxim "*Festina lente*" in the treatment of stricture by simple dilatation. They lay it down as a rule in these cases,

"That it is bad surgery . . . to reintroduce an instrument—unless it be filiform—before the lapse of at least seventy-two hours, and that more rapid progress will be made with the case by waiting till after ninety-six hours—often even until the sixth, seventh, or eighth day;" and that, "in brief, intervals of a week, especially in cases of old stricture, are generally more beneficial than any shorter period."

They also direct that, when an instrument has reached the bladder, it should be at once gently withdrawn, and believe that nothing is gained by leaving it even for a moment.

In a foot-note to the section on *External Perineal Urethrotomy, with a Guide*, Dr. Van Buren gives a plain, and, so far as we can judge, a perfectly candid and apparently truthful account of the introduction of what are commonly known as tunnelled urethral instruments—an account which those of our readers who also read the *New York Medical Record* will hardly need to be told differs in essential particulars from that which has been somewhat industriously circulated by a former assistant of Dr. Van Buren, who has thought proper to claim the invention as his own. We have no desire to take any part in this controversy, but feel that it is due to Dr. Van Buren to say that, judging from all the evidence on the subject which has been brought to our notice, we see no reason to doubt that the merit of the original suggestion of tunnelled instruments, be it great or small, is due to him, and to him alone.

We cannot do better, in terminating our examination of this part of the volume, than to quote the authors' "*Summary of Treatment of Stricture.*"

"1. Alkalies, diluents, and rest, are serviceable in most cases of stricture; sometimes indispensable if there be any serious complication.

"2. All uncomplicated strictures, not highly irritable or resilient, should be treated by dilatation with soft instruments up to No. 9, conical steel sounds afterwards; reintroductions being made every fourth to eighth day—the older the stricture the longer the interval as a rule, and intervals of one week being most serviceable in the majority of cases.

"3. All strictures at or near the meatus must be cut.

"4. Resilient, very irritable, and, as a rule, traumatic strictures are best treated by divulsion if they lie below four and one-half inches from the meatus, otherwise by internal urethrotomy. When a resilient stricture cannot be divulsed, it should be cut—internally.

"5. Impassable stricture may usually be overcome—where there is no restriction—by time, patience, and skill, with whalebone bougies. If finally proved impassable, the treatment is external perineal urethrotomy.

"6. Retention is treated by hot baths, ether, opium, tincture of the sesquichloride of iron; failing these, by puncture above the pubis with the aspirator or through the rectum to gain time; or by external perineal urethrotomy without a guide.

"7. For stricture complicated by abscess, infiltration, or many and large fistulæ, and for extensive traumatic stricture, external perineal urethrotomy.

"8. For infiltration, free incisions, stimulants, supportives, with thorough external division of the stricture.

"9. For fistula with loss of substance, local cauterization, lace suture, or plastic operation. Where there is no loss of substance, complete dilatation of the stricture is soon followed by closure of the fistula."

Chapters IX. to XI., inclusive, are devoted to *Diseases of the Prostate*, and furnish an excellent account of the various affections to which this

small but sometimes troublesome organ is subject. In referring to Thompson's anatomical investigations as to the frequency of enlarged prostate in old persons, no reference is made to Dr. Messer's more extended series of dissections (though Sir Henry Thompson himself refers to them with proper acknowledgment), nor to the similar but even more extended investigations made respectively by Professor Dittel, of Vienna, and by Dr. J. W. Lodge, of Philadelphia. To the two forms of "bar at the neck of the bladder," ordinarily recognized by surgical writers, Drs. Van Buren and Keyes add a third, which they describe as "centric median hypertrophy, where a transverse bar of hypertrophied tissue is formed, instead of the usual oval tumour." We confess that we see no advantage in separating this from the more common form of median hypertrophy which constitutes the so-called "third lobe of the prostate." The pages devoted to the treatment of enlarged prostate are eminently judicious and practical. We should like, however, to find some expression of opinion as to the plans which have been from time to time suggested as modes of *curative* as distinguished from *palliative* treatment—such as the use of pressure, originally employed by Physick, the various crushing and tearing operations still in vogue amongst French surgeons, and the interstitial injection of tincture of iodine recommended by Heine.

The section on *Cancer of the Prostate* does not impress us as favourably as those which precede it. Tanchou's statistics are quoted, but Thompson's exposition of their fallacy is not referred to, and no notice is taken of the very elaborate memoir on prostatic cancer recently published by Jolly.

Chapters XII. and XIII. are occupied with an account of various *Diseases of the Bladder*. A short account is given of the condition known as extroversion or exstrophy—the authors persist in spelling it *extrophy*¹—of this organ, but no mention is made of the ingenious operations suggested or practised, with the hope of effecting a radical cure in cases of this affection, by Simon, Lloyd, Athol Johnstone, Holmes, and Sydney Jones. The less ambitious, but more satisfactory mode of treatment by plastic operation, is briefly referred to, but its history is carried no further than the year 1865; had the authors been familiar with one or two papers which have appeared in this *Journal* during the last few years, they might, we think, have made this section of their work both more interesting and more valuable than it is.

Wounds and ruptures of the bladder, the presence of foreign bodies in this organ, and retention and incontinence of urine are successively considered, but the remarks upon these several subjects call for no special comment. An interesting section is devoted to chorea of the bladder, a rare affection, of which the authors give three illustrative cases, and which they have found amenable to hygienic and general tonic treatment. Three pages are given to the subject of hæmaturia, but no reference is made to Mr. Hilton's interesting lectures upon the aid afforded by examination of the coagula in ascertaining the source of the hemorrhage in these cases. The twelfth chapter terminates with an account of the affection known as neuralgia of the neck of the bladder, for which the authors recommend their favourite remedy—matrimony—with the occasional introduction of a conical steel sound.

¹ It is rather odd that writers who think it necessary to explain that "lithic acid" comes "from the Greek λίθος, a stone" (p. 259), should not have taken the trouble to look up the derivation of exstrophy, when they would, of course, have found its origin to be from στρέφω, *I turn*, and not from τρέφω, *I nourish*.

In Chapter XIII. are considered the important subjects of *Cystitis*; acute and chronic, *Pericystitis*, *Atony*, and *Paralysis of the Bladder*, and various rarer affections, such as tuberculosis and cancerous disease of this organ, and the development of fibrous, cystic, and villous growths. Battey's and Powell's operations of cystotomy for chronic cystitis are mentioned, but no reference is made to Guthrie as the original suggester of this mode of treatment, nor to the early operation of Willard Parker, nor to the more recent instances of its employment, in the female, in the hands of Sims, Bozeman, and Emmet. For simple atony of the bladder the authors recommended injections of cold water, beginning at a temperature of 90° F. and running down as low as 40°.

Chapter XIV., on *Stone in the Bladder*, contains a great deal of valuable information, conveyed in a plain and practical manner, and may be studied with advantage by every practitioner of surgery. In a foot-note to page 272, Dr. Van Buren gives an interesting account of "the first case of lithotomy with anæsthesia." We could wish that all surgeons were impressed with, and would practically act upon, the truth conveyed in the following sentence—a truth which applies as well to other capital operations as to lithotomy:—

"The simple fact that an operation can be done is no reason why it should be done in the face of very serious risk to life; and it is hardly necessary to say that the temptation to perform a capital operation, even at his urgent request, should never weigh for a moment against the best interests of the patient who places his life in our hands."

Some surgeons, however, seem to consider it a point of honour, in every case to do *something*, even if that something should but serve as a "happy despatch" to hurry their patient with redoubled velocity out of the world.

Lithotrity forms the subject of Chapters XV. to XVII. inclusive. The first suggestion of this mode of treating stone is, as usual, attributed to Gruithuisen (or, as his name is here spelled, Gruithausen), but no reference is made to the claim of priority which has been advanced, and, so far as we know, never disproved, on behalf of the Italian surgeons, Santorio and Ciucci. Sir Henry Thompson's statistics are quoted, but the authors seem to be familiar only with his report of 184 cases in the 53d volume of the *Medico-Chirurgical Transactions*, and not with his more recent and more elaborate report of 204 cases in the second edition of his *Practical Lithotomy and Lithotrity*. In speaking of the means employed to assist the evacuation of fragments after lithotrity in cases of atonied bladder, Clover's apparatus is described, but no allusion is made to the ingenious siphon arrangement, employed by Prof. Dittel, of Vienna. In this portion of their volume the authors recur to the subject of urethral or urinary fever; we venture to think that a study of Dr. Dickinson's admirable paper "On disseminated Suppuration of the Kidney," in the last volume (56th) of the *Medico-Chirurgical Transactions*,¹ would render them less emphatic in their denunciation of the "vague opinions" of those who are disposed to look upon this affection as a form of pyæmia.

Chapter XVIII. is devoted to the subject of *Lithotomy*. The authors do not seem to be quite clear as to the relative positions to be assigned to this operation and lithotrity. On page 280 they tell us that the latter "has taken position, not as a rival of lithotomy, but as a new and additional resource, etc.;" but on page 328 they say that lithotomy "is an operation of far less importance than its powerful rival lithotrity;" while

¹ See also No. of this Journal for July, 1873, p. 251.

on page 329 they again change their tone, and declare that "lithotomy still holds its place as one of the grandest operations of surgery, and still has no rival in at least fifty per cent. of all cases of stone, taken collectively, at all ages."

The lateral, median, and supra-pubic, are the only forms of operation described by the authors; this we think an error in judgment, for in a special text-book, such as they have undertaken to furnish, the student reasonably expects to find an account of every mode of proceeding which is not obsolete, and which is advocated by respectable authority. Even were the medio-lateral (Buchanan's), the medio-bilateral, and the pre-rectal operations omitted, at least the ordinary bilateral and recto-vesical operations should have received some attention. The directions given as to the manner of performing the various operations are usually clear and comprehensive, such, indeed, as would be expected from writers who are known as both skilful surgeons and practised teachers. As a matter of personal preference, we are disposed to consider fenestrated forceps, lined with linen, as more generally useful than the heavy bladed forceps which alone are described by the authors, and we think the direction given that the right side of the prostate should be invariably divided whenever the stone is more than one inch in diameter, unnecessarily sweeping, for we feel sure that stones of this size, or even somewhat larger, may, ordinarily, be removed with perfect safety by the single left-sided section. Speaking of the treatment of deep-seated hemorrhage, after the operation of lateral lithotomy, the authors recommend the tying in of a tenaculum, and describe and figure Keith's instrument (with removable handle), but do not mention the name of Physick, as having eighty years ago successfully resorted to this mode of treatment; nor do they make any allusion to the well-known forceps subsequently devised by the same surgeon for the application of a ligature in these cases. Prof. Gross's "artery compressor" is referred to, but no notice is taken of John Bell's advice to secure the bleeding vessel "by laying hold of it with the old artery-forceps and letting them remain for the night."

Chapters XIX. and XX. are devoted respectively to *Diseases of the Ureters* and *Diseases of the Kidney*. Chapter XIX. occupies less than a page, and though rupture of the ureter is alluded to, no notice is taken of the late Mr. Poland's valuable paper on the subject. Chapter XX. is upon the whole well done, but we doubt the wisdom of undertaking the description of what are generally recognized as *medical* affections in a *surgical* text-book; almost all the subjects discussed in this chapter may be found as well if not better treated of in works on practical medicine, and the space which they here occupy might we think have been more profitably occupied with other matters. In the section on *peri-nephritic abscess*, Dr. Bowditch's paper read in 1868 before the Boston Society for Medical Observation, is quoted, but the authors do not seem to have met with Dr. B.'s more recent and much more elaborate memoir published in the Report of the Boston City Hospital, for 1870, while Trousdale's investigations upon the same subject are not even alluded to. *Nephrotomy* for renal calculus is more favourably regarded by the authors than by most surgical writers, and more so, we think, than is justified by recorded experience. The famous case of the archer, quoted by Paré from Monstretet, which Drs. Van Buren and Keyes seem to look upon as authentic, may, we think, since Velpeau's *tranchant* criticism of it, be dismissed as apocryphal; while of the four cases which have been recorded since Mr. T.

Smith urged the revival of the operation,¹ two terminated fatally, and in the other two no stone was found. Hence, Marchetti's case remains as the only one in which the operation has hitherto proved successful. Half a page is given to *ablation of the kidney*, and Dr. Peters's paper is erroneously referred to as containing "a report of the only cases (three in number) where a similar operation had been performed previous to his own." A reference to the number of this Journal for January, 1873 (p. 278), will show that the number of cases on record is considerably larger than that given by Dr. Peters.

Chapter XXI. is devoted to *Diseases of the Scrotum*. A paragraph is given to the affection known as elephantiasis of this organ, but though it is stated that, in operations for removal of the hypertrophied scrotum, "patients are apt to die on the table, from hemorrhage, which is always excessive," no reference is made to the ingenious plans suggested for the prevention of this accident by O'Ferrall, Fayrer, and other surgeons.

Diseases of the Testicle form the subject of the next four chapters, which upon the whole afford a very satisfactory exposition of the important matters upon which they treat. This review, however, has already extended to such length that we must refrain from examining them with as much minuteness as they deserve. From expressions used on pp. 402 *et seq.*, we infer that the authors hold the view that the cure of hydrocele is invariably effected by the adhesion of the opposing surfaces, and consequent obliteration of the cavity, of the tunica vaginalis; such indeed we believe to be usually the fact, but several cases which have fallen under our own observation have led us to think that Mr. Erichsen is right in declaring that, in some instances at least, obliteration of the cavity is not necessary. We do not approve of the authors' recommendation that, in the treatment by iodine injection, a large quantity of fluid should be thrown in and subsequently withdrawn; we believe, with the late Mr. Syme, that a much surer method is to inject a small quantity of the undiluted tincture (not exceeding three fluidrachms), and to allow it to remain. Epididymitis is well described in this portion of the volume, in connection with orchitis proper (from traumatic causes, etc.), but no reference is made to what we consider the best mode of treatment, viz., puncture of the tunica albuginea, as originally suggested by Petit,² and more recently practised on a large scale by Vidal (de Cassis) and H. Smith. Puncture of the tunica vaginalis is alluded to, but this is a different, and, as we venture to think, a less efficient remedy. The section on tuberculous disease of the testicle is a very good one, but might we think have been still further improved by referring to Salleron's elaborate memoir upon this subject.

Chapter XXVI. is devoted to a consideration of *Maladies Involving the Genital Function*, and is, in our judgment, one of the best, if not the very best, in the whole volume. The delicate questions treated of in this chapter are discussed with modesty, and at the same time in a perfectly practical manner, and the authors' views seem to us decidedly more consonant with reason than those maintained by Mr. Acton in his well-known work *On the Functions and Disorders of the Reproductive Organs*.

Diseases of the Cord (including varicocele) are described in Chapter XXVII., and *Diseases of the Vas Deferens and Seminal Vesicles* in Chap-

¹ The modern literature of nephrotomy is not alluded to by the authors.

² Not PETIT le Grand, but a less famous surgeon who wrote in the early part of the present century.

ter XXVIII. We quite agree with the authors that varicocele, in the large majority of cases, requires merely palliative if any treatment; but we cannot subscribe to the doctrine which they advance that, when more radical measures are needed, "in the vast majority of cases but one operation is allowable, namely cutting off the redundant scrotum." On the contrary, we regard this as more severe than almost any other of the various modes of treatment which have been suggested, and as certainly more so than that of Mr. Henry Lee, which seems to us as little open to objection as any operation of the kind can be.

We have already consumed so much of our allotted space, in noticing the first part of Drs. Van Buren and Keyes's treatise, that we must greatly abbreviate what we should like to say about the second portion, that which treats of Chancroid and Syphilis. This we regret the less, however, because the views which they advance correspond in most respects with those which we have so often maintained in the pages of this Journal, and because there is little indeed in this part of the work to call for criticism.

One or two points, however, we cannot let pass unnoticed. We have already had occasion to comment upon Dr. Keyes's zeal for experimental study upon the bodies of his hospital patients, but we find in a foot-note to page 478 an observation which throws his hypodermic use of urine quite into the shade.

"It has been stated," he tells us, "that chancroid will not take upon a patient suffering at the time from acute febrile disease. To test this point, Dr. Fiset, at the Charity Hospital, at my suggestion undertook some experiments. They were, unfortunately, interrupted after the doctor had inoculated one patient three times upon the thigh, the gentleman in charge of the fever wards being fearful lest syphilis¹ should be introduced among his patients. . . . Two of the punctures took perfectly, although the process of ulceration was very slow. On the thirteenth day, pus from one of these ulcers was inoculated upon a healthy patient, with the effect of producing a characteristic chancroid. The ulcers on the leg of the typhoid patient finally became confounded in a single ulceration two inches in diameter, which was dressed with iodoform, and on the patient's discharge from the hospital, convalescing, after a sojourn of fifty-three days, the ulcer was reduced to a diameter of one inch, and was healing."

But on page 484 the authors declare (and truly) that

"During the whole period of its existence the chancroid furnishes auto-inoculable pus. The old theory, that after repair was well advanced the secretion ceased to be poisonous, is no longer tenable."

Hence this unfortunate fever patient was not only himself endowed with a disease from which he was free when he entered the hospital, but was sent out with a large, unhealed chancroid, ready to contaminate any unwary person with whom he might happen to come in contact. In *Care periculum* may be all very well, but when a chancroid is bestowed for the benefit of science upon an unsuspecting charity patient, he should at least be cured again before he is let loose upon the public.

On page 504, the authors give instructions for the opening of buboes, but neglect to say in what *direction* the incision should be made; this we consider a matter of some importance, believing that the healing process is more quickly accomplished when the incision is made to correspond with the long axis of the patient's body, than when, as is often done, it is made in a line parallel to Poupart's ligament. In the authors' remarks upon

¹ This gentleman could not, apparently, have been sound on the question of the *duality* of venereal sores.—REVIEWER.

the transmission of syphilis by inoculation of secretions, we find no reference to the early observations of Dr. Hammond, nor to those more recently published by Mr. Morgan and Mr. H. Lee. While we quite agree with Drs. Van Buren and Keyes that the initial lesion of syphilis is always a chancre, and that there is no condition to which the name of syphilitic gonorrhœa can with any propriety be applied, we think that the testimony now before the profession renders it unsafe to deny that, as *secondary* lesions, contagious urethral and vaginal discharges may occur in cases in which no ulcerations or abrasions can be detected.

In the *treatment* of syphilis, the authors recommend the use of mercury during the primary stage, in this differing from Dr. Bumstead and others, who postpone specific treatment until the manifestation of secondary phenomena; again the authors recommend that the mercurial course should be continued from six to eighteen months after the disease is apparently cured, while Bumstead suspends treatment within a few weeks after the cessation of all appreciable symptoms. For our own part we see no objection to the cautious use of mercury during the first stage of the disease, and believe that, though its employment may not prevent the occurrence of secondary symptoms, it at least renders them milder; when, however, the secondary stage has been safely gone through with, and the patient is restored to health, we see no advantage in further persistence in treatment, particularly as it is by no means certain that tertiary symptoms will occur in every case, and as, on the other hand, it is very doubtful whether the use of mercury under these circumstances actually exercises any prophylactic influence.

A few words must be said before concluding as to the qualities of the book, as a literary production. In spite of occasional but probably unavoidable repetitions, the authors' arrangement of their matter is convenient, and their style generally clear, concise, and elegant; we have, indeed, noted one or two odd words or expressions, such as *gouts* of mucopus, *pilimiction*, and "the diagnosis is *with*," instead of "the diagnosis is *from*;" moreover, we cannot appreciate that purism which leads the authors invariably to substitute "kidney-stone" for "renal calculus," while at the same time they try to naturalize such detestable barbarisms as "Cowperitis," "peri-cowperitis," and "phimosed." The numerous references in the foot-notes give an air of erudition to the pages of the book, but are in many instances of but doubtful utility; it is bad enough to be referred, as is frequently done, to a single large volume in a foreign language, without any indication of edition, date, or page; but how bald and valueless are such citations as "Guy's Hospital Reports" (p. 318), "Dublin Medical Press" (p. 94), and "Philosophical Transactions" (p. 370). As for the reference to Humphrey's paper on page 346, it is hardly necessary to say that the *Trans. Prov. Med. Assoc.*, for which Humphrey wrote, were the Transactions of the *Provincial*, and not of the *Providence* Medical Association.

The publishers' share in the production of the volume is deserving of all praise. The paper is good, and the printing neat and more than ordinarily accurate, while the illustrations, though not numerous, are usually appropriate and well executed.

In terminating this review we beg to say again that we look upon Drs. Van Buren and Keyes's Treatise as a very valuable contribution to surgical literature. Considering the wide range of the subjects which it embraces—covering, as it does, the same ground as the several works of Sir Henry Thompson, Mr. Curling, Mr. Acton, and Dr. Bumstead—it must be

looked upon as a model of judicious condensation, while at the same time every chapter shows that its authors have not derived their materials from books alone, but from the fertile field of a wide practical experience. If in the preceding pages we have seemed to deal more in criticism than in commendation, it is because the merits of the work are so obvious that he who runs may read; and because we have deemed it necessary to justify the charge which we felt compelled to make at the beginning, that the authors' research into the literature of their subject had been less exhaustive than they seemed disposed to believe. Should these lines fall under the authors' observation, we would venture to express the hope that in a second edition (which we feel sure will ere long be demanded) they will either make the book more exclusively didactic—imparting, as none have a better right to do, their own opinions only, with all the authority to which they are entitled—or else that they will spare no pains to make it in fact, as in design, a complete exposition of the existing state of genito-urinary surgery in all parts of the world. In the latter case we hope moreover that the work will possess, more than it does at present, an *American* character. The book is already such a good one that it would be a great pity if, for want of a little labour, it should not in future editions approach still nearer to perfection.

J. A., JR.

ART. XVIII.—*A Manual of Toxicology, including the consideration of the Nature, Properties, Effects, and Means of Detection of Poisons, more especially in their Medico-legal Relations.* By JOHN J. REESE, M.D., Professor of Medical Jurisprudence and Toxicology in the University of Pennsylvania, etc. 8vo. pp. 507. Philadelphia: J. B. Lipincott & Co., 1874.

TOXICOLOGY is a subject apt to be slurred or even not taught at all in our medical schools, and thus it comes to be the branch of medicine about which the average practitioner knows least. He has at his tongue's end the duration of a fever, the date when to expect secondary symptoms following a chancre, or the pathology of pneumonia; but if suddenly put on the witness-stand and asked how soon after taking arsenic the metal can be found in the liver; how long after death prussic acid can be detected in a body; or what are the lesions in phosphorus poisoning, he is pretty sure to cut a sorry figure; while of chemical analysis he generally knows nothing. Even in the practical matter of the therapeutics of poisoning, we see a suggestive indication of professional ignorance in the full directions for treating such cases commonly provided so carefully in physicians' diaries to the exclusion of the more usual catalogues of eclipses and tables of postage-rates. Dr. Reese's book should, therefore, be sure of a welcome on our tables, presenting, as it does, the practical essentials of toxicology in a compact and accessible form. The work may be divided, for the purposes of the reviewer, into two parts; the first being the chapters dealing with the general considerations of the science, and the second those occupied with the detailed account of individual poisons.

Dr. Reese begins with a carefully worded definition of a poison, and in view of the keenness of cross-examinations in the witness-box, it is well to have our ideas on this subject accurate.

"A Poison may be defined to be a substance capable of producing noxious and even fatal effects on the system, no matter by what avenue it be introduced; and this, as an ordinary result, in a healthy state of the body, and not by a mechanical action." p. 14.

In this definition the question of *quantity* of the poison required to produce the noxious or fatal effect is very properly not considered, since anything that practically can be introduced into the system in fatal or noxious amount, however large such amount must absolutely be, is plainly as much a poison as one whose fatal dose may be but a fraction of a grain.

Chapters II. and III. are occupied with the general physiological questions involved in the action of poisons, and are similar to the chapters on the same topics that preface the text-books on *materia medica*; embracing the consideration of local and remote action, absorption, elimination, circumstances modifying action, etc. In connection with the subject of absorption there is an important toxicological point so certain to come up in medico-legal cases, and so apt to be carelessly misconceived, that our author very wisely lays great stress on it in several places. It is simply that in fatal poisoning by agents that act only after absorption, it is not what is found in the *stomach* that caused death, but what, before death, had passed out of the stomach *into* the blood and thence to the organs and tissues. Strange to say, it is not uncommon to hear physicians wisely declare that unless a fatal dose of a poison can be actually found in a dead man's stomach, there is no reason to assume that death was from that cause. And on the witness-stand the expert is almost sure to be asked if he found "enough of the poison in the stomach to have caused death." The fallacy is self-evident upon a moment's thought. Considering the disposition of poisons after absorption, Dr. Reese says:—

"After the poison has entered the circulation, it may either be rapidly eliminated by the different emunctories, especially by the kidney, or it may be temporarily deposited in the organs and tissues of the body, and usually in the following order as to quantity: the liver, spleen, kidneys, heart, lungs, brain, and pancreas. Experiment has shown that only a minute quantity of the poison is circulating in the blood *at any one time*; the effort of the system evidently being to get rid of it as rapidly as possible. Moreover, there is good reason to believe that the poison is active *only while circulating in the capillary bloodvessels*: while still in the stomach, or after separation from the blood by the emunctories, or when deposited in the solid tissues, it is believed to be entirely harmless." p. 26; the italics are the author's.

To much of this we must demur. In the first place, elimination and temporary deposition in the organs and tissues are given as the only "dispositions" of a poison after it has gained entry to the blood. Surely it must be by inadvertence that a third important disposition is omitted mention, namely, chemical transformation while in the system; an effect which with many organic substances, as alcohol, morphia, etc., may even amount to permanent destruction of a great bulk of the poison as such. To the statement that there is, generally speaking, an evident effort of the system to rid itself of a poison as rapidly as possible, we cannot subscribe. Such is, we know, the common idea, and from what is thus assumed to take place in artificial poisoning, the analogous belief is held that many diseases are but attempts of "nature" to do the same thing with the subtle poisons unwittingly received from the marsh or the cess-pool. The question is one of great interest and importance, as the assumption of a natural eliminative tendency is sure to affect our treatment both of poisoning and disease. We believe it, however, to be a fallacy, and that careful analysis

of facts shows nothing looking like an intelligent endeavour of "nature" to cast out peccant substances, but that innocent and noxious agents alike are dealt with in the system strictly according to their physical and chemical properties, regardless of consequences to the health of the system at large. Elimination, chemical decomposition, or temporary fixing in the tissues thus follow blindly in accordance with general chemico-physiological laws. To suppose otherwise, is to assume the existence in each living body of a quasi-intelligent principle capable of knowingly setting up vital processes for an ulterior purpose in the interests of the general health. Such an assumption would be a revival of the old "Archæus," and is wholly opposed to facts. Take the case of alcohol: even in poisonous dose the elimination is now known to be trifling, and no more than must occur with any substance present in the blood in large quantity. The vast bulk of the alcohol is gradually dealt with strictly according to its chemical nature of an easily oxidized hydrocarbon, and, strange to say, the tissues that hold the poison unchanged the longest, and are the last to yield their absorbed portion to the venom-destroying process of oxidation, are the very nervous tissues themselves, which are the most poisoned of all by the substance in question. So that here, instead of an effort of nature to rid herself of a poison by elimination or otherwise, we have a veritable picture of her hugging the deadly asp most desperately to her bosom. But the matter is too vast to be discussed here, and we must refer the reader to the interesting papers of Dr. Anstie on the subject, by which the present remarks were suggested.¹

Dr. Reese's statement that "there is good reason to believe that poisons are active only while circulating in the capillary bloodvessels," surely cannot be meant to bear strict interpretation. If a poison act only while in the blood, it must logically produce its effect only by modifying either the blood or the circulation. That many do so act is of course true, but equally true is it, in all human probability, that others act, in part at least, by direct impression of the tissues; an action that must take place, of course, after the poison has got *out* of the blood and *into* the tissues. Is there any reason for not supposing that much of the profound nervous disturbance caused by ether, chloroform, or alcohol, is by actual soakage of the nerve-substance with these highly diffusible substances, instead of being purely a secondary consequence of an altered blood or blood-supply? Indeed Dr. Reese seems to think so himself, as in speaking again of the *modus operandi* of poisons, he says:—

"Liebig's theory (at least with respect to the action of the poisonous alkalis) was that they entered into chemical combination with the nerve-substance; morphia, with brain-substance, for instance; and thus the quality of the nervous matter being altered, it became unfitted to support life. Another theory is that poisons act by destroying the vitality of the blood. But as is justly remarked by Prof. Taylor, this destruction of the vital properties of the blood does not explain the specific differences of poisons, seeing that they do not act all alike.

"As regards any actual alteration *in the blood itself*,—either chemical or physical,—nothing has been yet satisfactorily demonstrated, except occasional changes in its colour, consistence, and coagulability. Microscopic observation has failed to show any alteration in the appearance of the blood-corpuscles that can be regarded as conclusive." p. 33.

Chapter IV. is short, but important, dealing with the question of the *post-mortem* imbibition of poisons, which is thus put:—

¹ The Practitioner, vol. viii. pp. 161, 356, and vol. ix. p. 84.

"Is it possible for a dead body to imbibe a poisonous substance from the soil in which it has been interred? and is it possible that a poison introduced into the stomach or the rectum, or by the hypodermic method, after death, should pass through the tissues by imbibition into other viscera of the body, so as to give rise to the suspicion of poisoning, when in reality the death had resulted from a different cause?" p. 38.

Practically the first proposition concerns only arsenic, and it is shown by clear reasoning and by direct experiment that as a matter of fact impregnation from arsenical soil does not occur. As regards the second question, a *partial post-mortem* imbibition of a poisonous substance from the stomach to contiguous parts may undoubtedly take place, but in such case a diagnostic circumstance would be the inevitable finding of the substance in greatest quantity in the parts immediately adjoining the site of introduction, and in the outer rather than inner portion of organs so impregnated. In this connection the effects of a possible *post-mortem introduction* of a poison are discussed, and diagnostic rules given.

Chapter V. deals with the medico-legal bearing of the various evidences of poisoning, including rules and warnings to the expert how to make his examinations as free as possible from every *conceivable* source of error. And to one who has never followed a case through the courts such rules are most timely; for nothing is more likely to happen to the beginner than the utter spoiling of what may be morally sure evidence by the careless failure to weld some one little link in the chain of rigid legal requirements. In his analysis of the weight of the different kinds of evidence our author is exceedingly cautious, and we heartily commend his conclusions, especially to the glibly-swearing class of medical witnesses. Thus, on the one hand, neither symptoms, *post-mortem* appearances, nor even finding of a poison somewhere in the body, can, *taken singly*, make out, with complete certainty, a death by poisoning; while, on the other hand, the non-production of the characteristic symptoms, lesions, or even the failure to find any of the poison in the body, does not necessarily in all cases break down the prosecution. We especially commend the following statement, with which we entirely concur: "no medico-legal case of poisoning can possibly be established by symptoms alone, for the reason that there are no *characteristic* symptoms of any single poison." p. 46.

Chapter VI. treats of "compound poisoning" and the possibility of the symptoms of a poison being masked or its effects modified by the simultaneous giving of another. In this connection Dr. Reese briefly gives the results of his own experiments to determine the compound effect of the more commonly used poisons.

Chapter VII. gives in detail the systematic method of chemical procedure to be pursued in a case of suspected poisoning, and Chapter VIII. reviews briefly the medico-legal questions connected with poisoning, as developed in the foregoing portion of the book.

Chapter IX. is on the *Duties and Privileges of Medical Experts*, and its subject matter is one with which every medical man should be familiar, as there is no one in the profession who may not be called upon to testify as an expert. Dr. Reese bewails—as who does not?—the wretched system by which any ignoramus, under the garb of "doctor" or "professor," may be foisted upon a court as an "expert," when his only qualifications may be that for three years he spent some of his spare time on the back benches of a medical college-amphitheatre, or that he once washed bottles in some chemist's laboratory. We confess we never could see why questions of science affecting the issue in a trial were not exactly analogous

to questions of law similarly involved, and why therefore they should not be dealt with in the same way. If a disputed point be about a matter of physiology, as whether a man died from a half dozen bullet-holes through his intestines or from morphia, the jury, themselves utterly ignorant of the subject, are allowed to decide any way they please, after listening, for guidance, to an indefinite number of irresponsible opinions from "experts," all tacitly assumed of equal weight, because forsooth the diplomas of the witnesses are all of equal length and breadth of sheepskin. But let the disputed point be one of *law*, a subject of which the jury is also ignorant, and the procedure is very different. An officer called a *judge*, designed to be selected for proven capacity and experience, is appointed to give the jury *his* decision in the matter, and by that they must abide; while to provide against his mistakes there are other, higher tribunals of similarly appointed experts, to whom an aggrieved party may appeal. Why not let questions of law be settled like those of physiology? Thus when a legal point arises in course of a trial, let counsel summon any curb-stone "attorney and counsellor-at-law," who after interviewing is found to hold the desired opinion, and, calling him a legal "expert," parade his professional lucubrations as conclusive of the knotty point. Then, after hearing a dozen such witnesses on each side, let the jury settle the matter to suit themselves, and the prisoner go hang on the wisdom of their decision. In Germany, it seems, a very different system prevails. Dr. Reese says :—

"In Germany it is, fortunately, otherwise. In criminal cases, the experts first summoned are exclusively those whom the State, after proper examination of their competency and skill in such particular inquiries, has duly authorized to act for this purpose; while in addition to this, there is organized a tribunal of experts, to which the opinions of expert witnesses can be referred." p. 12*.

A question quite important for a medical man to know is "whether an 'expert' witness is obliged to obey the process of a subpœna, like any ordinary witness, and testify in a given case *as to his opinion*, without a previous guarantee of an adequate pecuniary compensation." p. 123. Dr. Reese tells us that the law can compel any one to appear before any court in his own state, on service of a subpœna, though there are dissentient opinions of lawyers and judges on record as regards obliging a person to testify to a scientific opinion merely. We have always thought the law forcing the attendance of an expert as much a violation of personal liberty as would be one compelling a lawyer to accept an appointment to the bench, whether he would or not, but that is neither here nor there. In the matter of securing *pay* for professional services rendered to the state or the defence, we heartily agree with our author that the expert has the moral right to ample compensation, and should look to securing it with a sharp business eye, as experience shows a strong likelihood of his being outrageously cheated if he doesn't.

Chapter X. begins the systematic part of the work, and considers the classification of poisons. Here Dr. Reese very properly adopts the physiological instead of the naturo-historical basis of classification. No one who has not been kept awake at night by trying his own hand at it, knows the insurmountable obstacles in the way of classifying, by their action, medicines or poisons; and none such, therefore, will find fault with our author for saying that his arrangement "is, to a great extent, an arbitrary one, and necessarily imperfect." It is as follows:—

Table of Classification.

CLASS I. Irritants.	Order 1. Irritants proper.	Mineral.	{ Non-metallic. Metallic.
	Order 2. Irritants producing remote specific effects.	Vegetable. Animal.	
	Order 1. Cerebral.	Narcotics. Anæsthetics.	
CLASS II. Neurotics.	Order 2. Spinal, or Tetanics.		
	Order 3. Cerebro-spinal.	Deliriant. Depressants. Asthenics.	

(p. 134.)

The remaining chapters, which, of course, make up the bulk of the volume, are devoted to the detailed account of individual poisons. The plan followed is to give for each the essentials of its natural history, the symptoms of poisoning, fatal dose and period, therapeutics, lesions, and chemical analysis. We shall not attempt to follow the author through all these details; and, in a book of this character, which deals far more with well-ascertained facts than with opinions, there is really but little matter for an extended review. In general, the topics are treated of in a purely practical manner, the volume being a working handbook for the toxicologist; and as the latter is most concerned with the chemical detection of poisons, this branch of the subject is the one most fully presented, and is, indeed, very thoroughly done. In his symptomatology we do not think our author is so happy. Many of the descriptions are very meagre, and consisting merely of a bald enumeration of the functions disturbed, fail to present a vivid picture of the condition of the sufferer. Neither is the natural *sequence* of the symptoms always properly indicated, nor care taken to point out the usual from the exceptional effects. As an illustration, take the following account of belladonna-poisoning:—

“The symptoms are as follows: A sense of heat, and extreme dryness of the mouth and throat, with difficulty of swallowing, nausea, vomiting, giddiness, impaired vision, a flushed face, sparkling eyes, delirium of an excited maniacal character, spectral illusions, convulsions, followed by stupor and coma. The pupils are extremely dilated, and insensible to light. Cases have been reported where the pupils were contracted during sleep, but dilated in the waking state. Irritation of the urinary organs is not uncommon, such as strangury, suppression of urine, and hæmaturia. A scarlet eruption on the skin, resembling that of scarlatina, is frequently observed. The *delirium* is of a peculiar character. The illusions are sometimes pleasing, exciting violent laughter; at other times they produce furious actions. There is loss of consciousness. The symptoms generally manifest themselves within one or two hours after swallowing the poison; but in poisoning from the berries they may be delayed for several hours. In cases of recovery the symptoms are sometimes very long in disappearing.

“The following case is quoted from the *New York Journal of Medicine*, vol. viii. p. 284: ‘A man ate a pie made with the berries of belladonna and apples. A few minutes afterwards he complained of feeling drowsy; the lethargy soon increased; his countenance changed colour; the pupils became dilated, and he experienced a coppery taste in the mouth. On going up stairs he staggered, and, upon entering the room, he fell, and became insensible. He subsequently became delirious and convulsed, and died the following morning. A child, to whom a portion of the pie had been given, died on the same day.’

“The following instance of recovery is related by Dr. Gray (*N. Y. Journ. of Med.*, Sept. 1845, p. 182): A child between three and four years of age swallowed from eight to twelve grains of the extract of belladonna. About half an hour afterwards the expression of the patient was that of terror; the pupils were widely dilated, and immovable; the conjunctiva highly injected, and the whole eye prominent and very brilliant. The face, upper extremities, and trunk of the body exhibited a diffused scarlet appearance, studded with numerous papillæ, like the rash of scarlatina. The skin was hot and dry; pulse

increased in force and frequency; respiration anxious and stridulous. There was a constant but unsuccessful attempt at deglutition, with spasmodic action of the muscles of the throat and pharynx; and paroxysms of violent motion, with rapid, automatic movements, attended with convulsive laughter. Under the action of an emetic the alarming symptoms passed off in about three hours, and the child recovered, with the exception of a moderate diarrhœa, and a slight enlargement of the pupil." pp. 436-38.

Here the only real *description* of belladonna-poisoning is the narration of the second individual case. In the general account, where we naturally look for a systematic analysis of the effects of the poison, we have only a list of symptoms put together without order, and with no clue as to which are the more characteristic—which, that is, we should find even in slight poisoning, and which, on the other hand, only occur in severe or fatal cases. Vomiting and convulsions—unusual effects—are put in the same category with dilatation of the pupil and dryness of the throat and mouth—affections perfectly certain to occur if the system be at all poisoned; while the earliest, and one of the most characteristic symptoms, acceleration of the pulse, is not mentioned at all. And, on the whole, we think the reader will agree with us, that one who had never seen a case of belladonna-poisoning could hardly form, from the foregoing description, a clear mental picture of the rise and progress of the symptoms, of the condition of the sufferer at any one stage of the poisoning, or of how he would be affected by different amounts of the drug.

The following is the account of chronic iodine-poisoning:—

"In chronic poisoning (*iodism*) produced by the prolonged employment of iodine in medicinal doses, or by its external application, the symptoms are vomiting and purging, tremors, palpitation, pain in the stomach, cramps, salivation, general emaciation, and gradual absorption of certain glands of the body, particularly the mammae of females, and the testes of males: there is usually an increase of most of the secretions, and enlargement and tenderness of the liver. All of these symptoms are not generally present in every case of iodism, but they have been produced by small doses administered for a few days at a time." p. 210.

Here the very unusual effect—if, indeed, it occur at all—of atrophy of the breasts or testicles, is given among the more ordinary symptoms without a word of comment upon its rarity; and if we strike this out, the remainder of the description, so far as it goes, would apply almost as well to the poisoning by mercury as to that by iodine.

In speaking of poisoning by putrescent food, Dr. Reese surprises us by the following statement:—

"It is well known that the putrid animal matter of the dissecting-room, entering the blood through an abrasion of the skin, causes the most alarming symptoms, which often terminate fatally. There is extensive local inflammation of the veins and absorbents, together with diffusive cellular inflammation, and great constitutional fever of a low character." p. 359.

Here one would be led to infer that a dissection-wound almost inevitably produces grave or even fatal poisoning; whereas, as every medical student knows, such effects are exceedingly rare. Neither, in the ordinary sense of the word, is *putrid* animal matter the most virulent; poisoning being more apt to occur in autopsies on freshly dead bodies, than where decomposition has actually begun.

We make these various comments not in any carping spirit, but to furnish the reader with some vouchers for our opinion that the descriptions of poisoning in this otherwise good book will bear some revision and improvement.

But little attempt is made to analyze the nature of the physiological action of the "neurotic" poisons, an omission which, while saving many long and fruitless discussions, yet often deprives the student of the key to the understanding of the symptoms.

The sections on therapeutics are brief, but the latest discoveries in the line of treatment of poisonings are carefully given. We note one or two omissions—perhaps intentional—as the practical value of the antidotes is not yet clinically established. Such are Bamberger's copper antidote to phosphorus, the ethyl and methyl compounds of strychnia as antidotes to strychnia itself, and the use of hypodermic injections of atropia in hydrocyanic acid poisoning. One naturally turns to find what so careful an author says about the physiological antagonism of morphia and atropia; and considering the vast importance of the subject, from the frequency of opium-poisoning, we confess to a little disappointment at the fruits of our search. Dr. Reese is content to waive an analysis of the question, and merely state generally that "atropia is now generally regarded as a true physiological antidote to opium" "we cannot withhold our conviction that they are antidotal to each other in man." pp. 370, 371. Of course, we cannot discuss this much vexed question here, but we must say that since Dr. Reese's book is so likely to become a text-book for the beginner, we think he should have gone somewhat more into detail here, and have shown the reader just in what the antagonism would appear to consist. As it is, one who did not know might readily gather the vague and false idea that these two most complex-acting substances produce effects that in all respects nullify each other. In practice Dr. Reese directs in opium-poisoning that atropia "be carefully administered in successive doses until the pupils begin to dilate, and the breathing becomes increased in frequency" (p. 371); and in stramonium-poisoning that morphia, hypodermically, "be persevered in until its effects are manifested by the contraction of the pupils." (p. 446.) Our own opinion is, that the effect on the pupils is a bad, and even dangerous guide by which to regulate the use and dose of either alkaloid, especially in the case of morphia against atropia, and we cannot but regard the directions in stramonium-poisoning, just quoted, as highly unsafe.

As we have already said, the chemical part of the work is that to which the author has given most space. Here his directions are very full and explicit, and furnish an excellent practical guide to the toxicologist. The subject of spectrum-analysis is not treated of at all. In making this announcement in the preface Dr. Reese says:—

"The subject of *spectrum-analysis* has not been treated of in the present volume. This truly beautiful method of analytical research has developed the most wonderful results both in chemistry and in other departments of science. In point of delicacy, it far transcends the most subtle and refined chemical reactions; and, as a corroborative means of evidence, it will doubtless prove of great value to the toxicologist. But as it deals, so to speak, with infinitesimals, we do not think it would be safe, in a case of alleged poisoning, to rest the evidence solely upon the spectral demonstration of the supposed toxic agent, to the exclusion of the recognized *chemical* tests. When an accumulated experience with spectral analysis has rendered the identification of the various poisons absolutely and *exclusively* certain, we can probably afford to abandon altogether the more tedious and complex methods of chemical research." p. ix.

Considering how careful Dr. Reese has been to confine himself to practical matters, the omission of the subject of spectrum-analysis is not at variance with the general scheme of the work.

E. C.

ART. XIX.—*A Treatise on Therapeutics, comprising Materia Medica and Toxicology, with especial reference to the application of the physiological action of drugs to clinical medicine.* By H. C. WOOD, Jr., M.D., Professor of Botany and Clinical Lecturer on Diseases of the Nervous System in the Medical Department of the University of Pennsylvania, etc. 8vo. pp. 578. Philadelphia: J. B. Lippincott & Co., 1874.

THE progress of medicine, from the blind guessing of empiricism towards the goal, still far distant but not undiscernible, of scientific certainty, can nowhere be traced with greater ease or interest than in the treatises on materia medica and therapeutics which have appeared, with their offers of healing for the nations, in countless numbers, from the time that Nechepsus, six hundred and thirty years before Christ, wrote that "a green jasper, cut into the form of a dragon surrounded with rays, if applied externally, would strengthen the stomach and organs of digestion," to the appearance of the treatise before us. The materia medica of Galen, in which, according to his celebrated hypothesis, the properties of all medicines are stated to depend upon their four *cardinal* qualities, heat, cold, moisture, and dryness, and in which medicines are advised for the treatment of diseases in proportion as the latter are hot, cold, moist, or dry, reflected the speculative character of the therapeutics of his age. The materia medica of Paracelsus, with its extraordinary doctrine of signatures, was an apt illustration and natural outgrowth of mediæval medicine. Nicholas Culpeper's Physicians' Library, with its preface "Astrologo-Physical Discourse of the Humane Virtues in the Body of Man," and its description of the "roots, herbs, seeds, living creatures, stones, tears, barks, fruits, spirits, physical wines, excrements, oyls, ointments, minerals, plasters," etc., mirrored the absurd conceits and strange hypotheses of the therapeutics of the seventeenth century. Jonathan Pereira's *Elements of Materia Medica and Therapeutics*, a magnificent monument of human industry and learning, indicate perhaps more vividly than any other work the great advance which the medicine of the first part of the nineteenth century made over its predecessors, but they also show how little scientific accuracy there was in the application of drugs to the treatment of disease during the same period. Dr. H. C. Wood's *Treatise on Therapeutics, Materia Medica, and Toxicology* (which has just appeared), indicates the physiological direction that recent therapeutical study has taken, and fairly presents the acquisitions that therapeutics has made in following out its chosen path.

Dr. Wood's *Treatise* is a handsome, large octavo volume, of five hundred and seventy-eight pages, dedicated to his uncle, the venerable Dr. George B. Wood, whose name is so honourably associated with American medicine. It is, as stated by the author in his preface, an attempt to present to the medical profession

"A book into which should be gathered the many scattered facts in regard to the physiological action of medicine—a book in which an attempt should be made to sift the true from the false, to reconcile seeming differences, to point out what we know and what we do not know, and to give a platform from which investigators might start forward without the necessity of being, as is so often the case, ignorant of what was already achieved, or of spending a great deal of time in a wild hunt through the almost boundless, but often scattered and inaccessible ranges of Continental literature."

The book commences with a brief introduction, in which pharmacy, the

United States Pharmacopœia, modes of administering drugs, influences that modify the action of remedies, and rules for doses are referred to, and a classification of the materia medica presented. The latter, which Dr. Wood properly styles only "a convenient row of pegs upon which to hang our ideas and facts," is substantially a physiological one. By it, remedies are arranged in three large divisions: *First*, general remedies, such as astringents, tonics, cardiac stimulants, etc.; *second*, local remedies, such as emetics, cathartics, diuretics, etc.; and *third*, substances which act externally to the body, as antacids, anthelmintics, etc. The names of some of the classes of these divisions are themselves hints of the new direction that the study of the materia medica has taken. Analgesics, mydriatics, anæsthetics, depresso-motors, oxytocics, and digestants would have been unintelligible terms to Culpeper, and possibly some of them to the philosophic Donald Monro. The chief part of the book is, of course, devoted to a description and discussion of the various agents of our present materia medica. It should be mentioned that drugs alone are included in this description. Climate, occupation, exercise, mind, electricity, food are only incidentally referred to by Dr. Wood, not described as remedial agents.

It adds to the value of the work, that it is not encumbered with needless learning. Very little is said about the history of the drugs that are described. Students who desire to learn the pedigree and biography of the drugs they use, or to be informed concerning the various transformations that drugs have undergone from the time of Æsculapius till now, will find little to satisfy them in the treatise that is before us. In like manner, very little is said about the botanical characteristics or chemical properties of drugs. The reader is properly permitted to gather this sort of information from professed works on botany and chemistry. And so with regard to pharmacy, the importance of pharmaceutical manipulations is recognized, but they are not described. This plan, which excludes the history, botany, chemistry, and pharmacy of the materia medica from discussion and consequently brings the reader directly without preface to a study of the physiological action of each drug, is one of the best features of Dr. Wood's book. The medical student and practitioner desire to get at the preparations they are to employ at the bedside as directly as they can, and to be introduced with the least possible ceremony to their physiological action and therapeutical use. This course Dr. Wood has steadily pursued.

Another excellent feature of the book is the space that is allotted to describing the physiological action of drugs. Too little attention has been paid, hitherto, to this fundamental part of the materia medica. Eleven pages, for example, are given to an analysis of the physiological action of the sulphate of quinia, and less than half that number of pages to an account of its therapeutical application. The latter is a corollary from the former, and can be stated in a few words, if the physiological is well made out and clearly stated. All the important drugs, such as opium, belladonna, digitalis, alcohol, aconite, etc.; are discussed in a similar way, that is, first physiologically and then therapeutically.

It would be impossible or difficult to estimate accurately the amount of labour that observers in Europe and this country have spent during the last twenty or twenty-five years in their efforts to solve the problem of the physiological force of drugs and to ascertain the mechanism of their therapeutical action. Physiologists have endeavoured to trace with absolute certainty the time and rate and mode of the entrance of drugs into, and diffusion

through, and departure from the organism; and to learn the exact phenomena that attend every step and stage of the process of drugs from the moment of entrance to the last moment of elimination, transformation, or destruction. The record of all this work is to be found chiefly in the medical journals of Europe and America, and in the various monographs upon drugs that have appeared on both sides of the Atlantic within the last quarter of a century, and especially within the last two decades. We know of no book in the English language which has collected so thoroughly the best work in this direction of the last twenty years and arranged it so well. While it is not exhaustive in this way, it contains the best that has been done and leaves out very little of value. The *Practical Therapeutics* of Dr. Edward John Waring, which was republished in this country seven of eight years ago, we have hitherto regarded as the best treatise of the sort accessible to the English reader, but the physiological portion of Dr Wood's work is much fuller and more complete than that of his transatlantic colleague. Those who are familiar with German medicine will be reminded by the book before us of Nothnagel's recent treatise rather than of any English or American writer on *materia medica*.

It is not to be expected in a treatise of this sort that all portions of it would be of equal excellence. Some parts must necessarily be fuller and more exact than others. Such is the case with the work before us. Notwithstanding this, it may be justly said of it that while none of its articles are poor, some of them are not only good, but are admirable illustrations of physiological and therapeutical description. The articles on *Belladonna*, *Digitalis*, *Aconite*, *Alcohol*, *Opium*, and *Indian Hemp* may be mentioned in confirmation of this remark. They give in clear and distinct language excellent accounts of what has been ascertained up to the present time with regard to the physiological action and therapeutical use of these drugs. Our author's statement of the comparative value as anæsthetics of sulphuric ether and chloroform presents the anæsthetic merits and demerits of these two agents with judicial fairness. It deserves attention on both sides of the Atlantic. With regard to the first, he says:—

“As an anæsthetic, ether does not act with the rapidity and pleasantness of chloroform, but it has the advantage of safety. So dangerous is chloroform, and so safe is ether, that there is no excuse for the use of the former agent under ordinary circumstances. The reason of the safety of ether is that, unlike chloroform, it never suddenly paralyzes the heart. It may kill by inducing asphyxia, but it does so slowly, and in the great majority of cases after warnings which can be overlooked only through the most reckless carelessness.” p. 245.

With regard to chloroform, he remarks:—

“As an anæsthetic chloroform possesses the advantages of quickness and pleasantness of operation, smallness of dose, and cheapness. These advantages are, however, so outbalanced by the dangers which attend its use, that its employment under ordinary circumstances is unjustifiable. It kills without warning, so suddenly that no forethought, or skill, or care can guard against the fatal result. It kills the robust, the weak, the well, the diseased alike, and the previous safe passage through one or more inhalations is no guarantee against its lethal action. Statistics seem to indicate a mortality of about one in three thousand inhalations, and hundreds of utterly unnecessary deaths have now been produced by the extraordinary persistence in its use by a portion of the profession. It ought, therefore, never to be employed except under especial circumstances, as in some cases of *puerperal eclampsia*, when a speedy action

is desired, or in the field during war-time, when the bulkier anæsthetics cannot be transported." p. 251.

The solution of the problem of the proper use of alcoholic liquids must and will be finally made by the physiologist and physician, and it is the duty of the medical profession to enlighten the public upon this grave matter of therapeutics, morals, and sanitary science to the extent of their knowledge and ability. Dr. Wood's statement of the value and use of alcohol is not less important to the reformer than to the physician, and few physiologists will be found to deny its correctness.

"From what has been said," he remarks, "it is certainly deducible that alcohol in small amount is an *arterial* and *cerebral stimulant*, increasing functional activity in the nervous and circulatory apparatus; is a *food*, in the sense that it is destroyed in the system, and there performs a physiological office; is, when in sufficient quantity, a retarder of tissue changes, because it lowers animal heat independently of any action on the nervous system, and also probably checks the excretion of carbonic acid and of nitrogen. . . . If alcohol be oxidized in the body, and be a food, as it seems to me is clearly proven, it must of course generate force, measurable by the modern standard of the heat-unit. A little calculation will show the importance, or rather the great amount, of the generated force. According to Dupré one gramme of alcohol oxidized in the body evolves 7184 units of heat, whilst the same weight of lean beef gives off only 1482 units of heat. It has been estimated that 9.3 ounces of lean beef, equal to about two ounces of alcohol, will supply the necessary force to maintain the circulation and respiration of an average man for one day. That is, four ounces of strong spirit will suffice for this purpose. Since, to the ability of furnishing material whose consumption shall give power is added the ability to restrict waste and to stimulate the functions of circulation and of the nervous system, it is evident that in alcohol we have a most important means of sustaining the system during the strain of an acute exhausting disease." p. 109.

The therapeutic deductions which follow from these actions of alcohol on the human system are obvious, and need not be quoted; and it should be added that the moral and sanitary deductions are not less obvious nor less important than the therapeutic ones. When those who advocate the daily use of spirits, wines, etc. are wise enough to recognize the tremendous evils that alcohol inflicts, and those who advocate its prohibition and extermination are wise and broad enough to recognize the good it is capable of doing and has done, we may hope for a better public sentiment upon the vexed question of alcohol, and for wiser legislation with regard to it.

During our reading of Dr. Wood's treatise we had marked several other articles than those we have mentioned for comment and some for criticism and dissent, but the length which this notice has attained forbids any allusion to them. It only remains for us to refer the reader to the book itself, with the assurance that he will find it a most valuable addition to his medical library. It is a sort of work on *materia medica* and therapeutics that has been long needed both by the practitioner and student, and we congratulate the author upon his success in carrying out a most difficult undertaking. Only those who have worked among the tangled heaps of wheat and weeds that encumber the therapeutics even of the last half century, and tried to sift the grain from the chaff, can appreciate the difficulty of producing a work like the one before us.

We ought not to forget to add, in conclusion, that the typographical execution of the volume is excellent, and creditable to the house that issued it.

E. H. C.

ART. XX.—*The Principles and Practice of Medical Jurisprudence.*

By ALFRED SWAINE TAYLOR, M.D., F.R.S., Lecturer on Medical Jurisprudence in Guy's Hospital. Second edition. 2 vols. 8vo., pp. xvi., 723, xii., 672. Philadelphia: Henry C. Lea, 1873.

THE author of these volumes has been so long and favourably known as an authority on the subjects of which they treat that we gladly welcome them as representatives of his matured experience. Dr. Taylor is best known to American readers by his *Manual*, which has passed through many editions under the care of no less than three editors in this country, yet we cannot but regard with pleasure the fact that there should be sufficient demand for the larger work to justify its importation at this time, hoping that it may be an omen of a diminishing taste for bare abstracts, and of an increasing relish for comprehensive treatises, as thorough scientific acquirements are but little advanced by manuals, which enable us to know a little of everything, and have a smattering of many branches of knowledge. We propose to draw attention to some points in this work which have interested us, and which have a bearing upon the duties of general practitioners, without attempting to present an epitome of volumes so exhaustive in their character.

We are met at the outset by the subject of medical evidence, than which none more disturbs the mind of the physician when called to the witness stand, or more excites his interest as a mere scientist, anxious for the progress of legal medicine. It is also one which is justly regarded by the public as of much importance, and yet one which, from the laxity of rules which govern it, or want of system observed in their application, bids fair to be eventually viewed by the community with unmixed and merited contempt. Dr. Taylor devotes two chapters to the subject, discussing it with sufficient fulness and precision; his conclusions being especially worthy of consideration, coming, as they do, from one whose experience in the English courts has been so varied and extensive. He speaks of medical men appearing as simple witnesses of facts which have occurred in the course of their ordinary business; as medical experts, either in obscure cases where, the interpretation of the facts being disputed, their especial skill, founded upon experience, is expected to shed light upon the legal puzzle; or in the somewhat invidious position of medical counsel. Of ordinary medical witnesses it is sufficient to say that their testimony is subject to the ordinary rules of evidence, and will necessarily partake of the character of those who give it, and that they will best provide for their own comfort, and further the ends of justice, who aim only at telling the truth, testifying that they have seen with as small an admixture of mere theory or personal opinions as practicable, remembering that the more observant and accurate a man is the more valuable will his testimony be. When we consider the position of medical experts, however, the question is very different, and beset with difficulties. In this country and England, either prosecution or defence is at liberty to call any doctor, and dub him expert for the occasion, without much reference to his previous record or special fitness. As a consequence, the whole local profession, if necessary, is submitted to a process of filtration until some one is found who holds the views required by the exigencies of the attorneys. By such means diametrically conflicting testimony is surely obtained, and the administration of justice is dis-

graced by vindictive and even personal contests between the so-called experts. To apply a remedy to this state of things is difficult in a country where the centralization of the government is not sufficient to permit of the adoption of the excellent system in force in some of the German States. In Prussia all disputed medico-legal questions are submitted to a governmental medical bureau, which is so arranged that each judicial district has its legal surgeon, physician, and chemist. Should an appeal be made to a higher court there is a correspondingly higher medical tribunal, before which the case comes, and from the highest there is no appeal. These officers receive very moderate salaries, and occupy the responsible position of judges of medical facts, being presumed to be beyond corruption or interest. In view of the difficulties which would be likely to attend the attempt to introduce so decided a reform, Dr. Taylor proposes that the judge before whom a disputed medico-legal case comes should have the power and responsibility of appointing the expert; or that either side, should they be unable to unite upon one, should each select one, who together might agree upon a third, as in an ordinary arbitration, who might decide any questions submitted to them by the judge, and, as assessors, give a proper estimate of the value of the medical testimony.

Chapter III. treats of questions concerning the dead body, and gives the signs of death, enumerating as such, cessation of respiration and circulation, cooling of the body, and cadaveric rigidity. Under the last-mentioned head will be found much of physiological interest. The investigations of Brown-Séguard are detailed, and his conclusions given as follows: The greater the degree of muscular irritability remaining at the time of death, the later cadaveric rigidity sets in, and the longer it lasts. It would also appear from the observations of the same gentleman that the later putrefaction begins, the more slowly it progresses. After showing that muscular spasm may pass into *post-mortem* rigor, and narrating some old, though interesting cases, Dr. Taylor goes on to speak of the reality of death, carefully sifting the statements which have been made about premature interment. While he justly criticizes those authors who have made this subject so great a bugbear, stigmatizing them as terrorists, he yet thinks it would be well to pass a law prohibiting the burial of a body without the certificate of a physician who has seen it at least twenty-four hours after the time of apparent death, and such a measure he thinks would be much more satisfactory than attempting to provide the ignorant public with some so-called infallible sign by which to decide the fact of death. A recent case, and one which is apparently veritable, is given on page 77, which we here transcribe with Dr. Taylor's comments:—

"Near Morlaix, in France, a woman died, as it was supposed, from cholera. She was seen while ill by a medical man, but not after the supposed death. She was placed in a coffin in an hour, and buried in sixteen hours. During the interment a noise was heard in the coffin. Time was lost in sending for a medical man, and the coffin was not opened until he arrived. The shroud was found twisted and folded about the neck and feet, as if struggles had been made, and there was a quantity of liquid on it, which had issued from the mouth and nostrils during efforts made to breathe. The body was warm, and not rigid; there was a general relaxation of the muscles: the hand was translucent to light, and the pulsations of the heart had not completely ceased! Efforts were made to resuscitate the person, but without success. These conditions are consistent with death from cholera, with the exception of the last. If the medical officer was correct in his observation, this person had really been buried alive."

Devergie's report upon the above will be found in *Ann. d'Hyg.*, 1870, 2, 310.

Dr. Taylor directs attention to the differences which exist between superficial extravasations produced by violence during life, and the mere hypostatic staining which occurs after death, yet he does not follow the example of many other writers, who restrict the term ecchymosis to the former variety, and use the word suggillation when speaking of the latter condition, by which all possibility of confusion in the use of the terms is removed. As a consequence, all through the book we meet with ecchymoses, which could be demonstrated to be such by the extravasations revealed upon incision, and ecchymoses in which no effused blood can be found, and which must therefore be regarded as mere *post-mortem* stains.

Putrefactive changes are considered in a chapter of great interest and value. It is always curious to trace the source of old fables; especially is this the case when, as in the text, we find an instance where the fable is shown to have been based upon scientific facts. Observations upon the dead body have shown that, at a certain stage of natural decay, the blood becomes again fluid, being easily extruded from any external wound by pressure; and here we have, in Dr. Taylor's opinion, that which will account for the well-known superstition of the middle ages, that contact with the hand of the assassin would cause the wounds of the victim to bleed afresh. The almost equally old story, that quicklime will hasten the progress of putrescence, receives at the hands of Dr. Taylor a *coup de grace*, as he well shows that, so far from hastening decomposition, lime rather exerts a conservative influence upon animal tissues.

Changes taking place in the bodies of those drowned are discussed at some length. The difficulty of establishing any fixed rule as a criterion to determine the time of death is well shown, though it is admitted to be quite practicable, and very important to study and apply the general rules laid down by Casper and Devergie. But slight detailed reference is, however, made to Casper's experience, which was most extensive, and his conclusions the most exact with which we are acquainted. Either Dr. Taylor's personal experience in this matter has been slight, or it is a subject in which he feels little interest, for he only refers to the single fact that the uterus is among the last of the soft organs to undergo decay. We think it well to give here a synopsis of Casper's table, in which is recorded the results of his own observations, which is published in his own work, and transferred therefrom into most works on legal medicine, the accuracy of which can hardly be questioned. The order in which the soft organs undergo putrefactive change is: 1, trachea; 2, brain of young children; 3, stomach; 4, intestines; 5, spleen; 6, omentum and mesentery; 7, liver; 8, adult brain; 9, heart; 10, lungs; 11, kidneys; 12, urinary bladder; 13, gullet; 14, pancreas; 15, diaphragm; 16, large arteries; 17, uterus. The spleen sometimes precedes the stomach and bowels, while the lungs occasionally change places with the heart, but Casper claims, in the most emphatic manner, that the average will be in favour of the order given above.

Evidence to be derived from bones is dwelt upon at much length, poor Dr. Parkman's skeleton being represented as travelling across the page with much grace, in company with the mutilated remains found on Waterloo Bridge some years since, and which, by the way, were never recognized. Priority of death and survivorship also receive very particular notice, many curious cases being cited; but the points made, and the

decisions rendered, in most of them, will principally interest the legal profession; indeed, this chapter is chiefly valuable as showing what medical science, at present, cannot prove, and as affording illustrations of the value and weight of circumstantial evidence.

Passing over the subject of poisoning, which, though perhaps the most authoritative portion of these volumes, we think should form a separate treatise, or at least be reviewed from the standpoint of a toxicologist, rather than from that of a general practitioner, we come to wounds and personal injuries. The consideration of these subjects extends through numerous chapters, forming one of the grand divisions of the work.

Varying definitions of the term *wound* are given, and criticized in succession. Dr. Taylor justly declares his preference for that one in use upon the continent of Europe, which says "a wound includes any personal injury suddenly arising from any kind of violence applied externally, whether such injury is external or internal;" or, as still better, that which defines it as "a breach of continuity in the structures of the body whether external or internal, suddenly occasioned by mechanical violence." Though these may possess no especial value to surgeons, they are claimed to be of much service in a medico-legal sense, tending to simplify the practice of the courts. The whole subject is treated thoroughly and at length, with a good sprinkling of legal points and decisions, which our limits prevent even an examination of. On page 515 a case is cited where the chain of evidence proved deficient because the bullet which had caused death was too large for one pistol and too small for another. This case has caused us much perplexity; we have pondered over it—we have read and re-read it, and we remain in a maze—for while it is readily understood that a large bullet cannot come from a small bore, we can, despite all our efforts, see no obstacle in the way of a small ball being projected from a weapon of the largest calibre. We are forcibly reminded of the story told of Sir Isaac Newton, and think that we can enter into the feelings of his carpenter when told by the philosopher to make a big hole in the study door for the big cat, and a little hole for the little cat.

Spectrum analysis receives considerable attention, being regarded as a valuable aid in the investigation of doubtful stains—at least in the hands of one skilled in its application. Mr. Sorby thinks he has been able to detect so minute a quantity of the colouring matter of blood as the thousandth of a grain. Evidence to be derived from a microscopic examination of hæmatic crystals would also seem to possess value, though like that deduced from the spectroscopic analysis, the basis of accurate observations upon which it rests is as yet too slender to give it much weight in a court of law. Of course, where the blood-corpuscles are not disintegrated, the microscope affords irrefragable proof, while the guaiacum test seems to have the most positive value where these bodies have been destroyed.

While the general consideration of wounds is very full, and many cases, together with the surgery involved in their treatment, are given at some length, we are surprised to find that wounds of the genitals are slurred over hastily, the paragraphs devoted to them being distinguished by unusual meagreness. The most striking recorded cases are not cited, so that any one who has occasion to consult Dr. Taylor's work upon this particular point will find but a poor reflection of the literature of the subject, which at best is not extensive.

Gunshot injuries, when small shot have been used, are treated of with minuteness, but while the experiments of M. Lachèse are quoted to prove the distance at which fine shot will act as a single missile, no reference is made to the length of barrel, or size of bore of the weapon used, or the comparative proportions of powder and shot with which it was charged,—factors which should enter largely into the question, and about which most information will be derived from books like those of Mr. Greener or Colonel Hawker. Indeed, in all such cases it would be better to call to the stand some practical sportsman or gunmaker, as much more likely to prove a skilled expert in such matters than the majority of physicians.

Burns are considered at length, Dr. Taylor thinking it necessary to give pretty full information upon the subject, even to the inclusion of the classical six degrees of Dupuytren. In Chapter LI. that fruitful resource of the writers of mysteries, the spontaneous combustion of the human body, is rightly shown to be without foundation in fact, and in total opposition to the truths of science, as no authentic case, where there was an absolute absence of a starting fire, is upon record. Immediately following is a very interesting account of the conditions under which the process does take place in substances used in the mechanical arts. That this, however, is a matter which should not come within the province of a medical expert, is well shown by the story told of M. Chevallier, whose opinion was required concerning the origin of a fire. While pondering the matter he noticed smoke issuing from a heap of cotton waste, and was informed by a workman from whom he inquired the cause of the phenomenon, that spontaneous ignition often occurred in masses of that material. Being thus furnished with information from one truly an expert in such matters, he was able to go into court and give a conclusive opinion.

Asphyxia, the third grand division of Dr. Taylor, is treated of under the heads of Drowning, Hanging, Strangulation, and Suffocation. All these subjects receive most thorough attention at the hands of our author, the cases narrated, both old and new, being numerous and valuable. The chapter upon hanging is illustrated by several wood-cuts, which show that, in order to produce a fatal result, it is by no means necessary for the body to be completely suspended. The difficulty of proving by the *post-mortem* appearances alone that death has resulted from simple asphyxia is fully demonstrated, and the sensible claim is made that in the attempt to reach a conclusion, the medical man should not be denied access to those details of circumstantial evidence by which alone, oftentimes, a decision can be attained. In drowning, however, the physical appearances are sufficiently decided to permit the formation of a positive opinion in the vast majority of cases. These appearances may be briefly stated to be: 1, engorgement of the venous system; 2, congestion of the lungs and infiltration of their substance with water; while, 3, the windpipe, bronchial, and minute air-tubes contain more or less froth. The above signs are almost constantly present, and when to them is added the presence of water or foreign substances in the stomach and air-passages, fulness of the right side of the heart, with other symptoms sometimes seen, there can be no doubt of the diagnosis.

Although deaths from irrespirable gases may be properly ranked with cases of poisoning, they are treated of in Chapter LVII., where, besides the legal aspect of such cases, will be found much that is valuable in a hygienic point of view. It is a noteworthy fact that the circumstance of a candle

continuing to burn, in opposition to the generally received opinion, does not afford proof that the surrounding atmosphere is sufficiently free from deleterious gases to be suitable for respiration.

Death from lightning, cold, heat, and starvation is considered in one chapter of eighteen pages. The first and last of these causes alone receive anything like just attention. From the fulness with which many surgical and medical points are given, which too often have no possible bearing upon the medico-legal view of the case, we confess to a feeling of surprise when we find the subject of the effects of cold comprised within three pages, while that of the effects of heat is compressed into less than one. Now, were these volumes merely the reflection of Dr. Taylor's own experience in Great Britain, we should not wonder at so decided an omission, but the work claims—and, for the most part, justly—the title of a treatise on the Principles and Practice of Medical Jurisprudence, and as such should show more fully the results obtained by those who have made these subjects matters of special study.

We pass next to Obstetric Jurisprudence. Pregnancy can come before the English courts in but one of two forms—where the asserted pregnancy of a widow affects the position of the otherwise legal heir—or where plea for a stay of execution on account of its existence is entered. The signs of its existence, in the living and dead, are given, but not with sufficient minuteness to render this portion of the book authoritative. The possibility of unconscious impregnation is admitted with quite enough freedom, but the cases quoted are few. Delivery occupies the next place. Great stress is laid upon the fact, that, in order to properly decide a question of recent delivery, much must depend upon the age of the uterine contents, and the difficulty will be in direct proportion to the length of time which has elapsed since the supposed delivery.

Abortion forms the subject of two chapters. The old distinction between emmenagogues, which stimulate the vessels of the womb, thereby promoting a menstrual flow, and ecbolics, which directly induce contraction of the uterine fibres, is revived, it being held that, while we have many drugs belonging to the former class, ergot stands almost, if not entirely, alone in the latter, and this we believe to be in accord with the best authorities upon the subject. The remarks upon the induction of premature labour by general practitioners, without a previous consultation, while many may deem them old fashioned, strike us as both sensible and forcible, for it may well happen that a physician whose practice has not been largely obstetrical, may, by a neglect of this precaution advised by Dr. Taylor, find himself most awkwardly situated, should he be sued for producing criminal abortion. As in England and France, the mere attempt to procure abortion is treated as criminal, the case is not affected should it be one of extra-uterine foetation or monstrosity, or even should it be proved that pregnancy has not existed at all.

Birth and inheritance next confront us with their attendant intricate legal questions. Dr. Taylor thinks the best and simplest test of live birth is auscultation, for when the heart sounds can be distinctly made out there can be no difficulty in pronouncing that the child has been born alive; but until we can distinctly define human life and demonstrate its starting-point, there will always be room in these cases, for an ample display of casuistry upon the part of ingenious counsel. The law, being regarded as an exact science, capable of establishing its own rules of evidence, might perhaps best settle the matter by requiring proof of a

certain duration of undoubted life, to be determined by definite signs, even if such a series were somewhat arbitrary.

Treating of monstrosities, our author speaks of the Siamese twins, Chang and Eng, whose recent death has brought them again to the notice of the profession. Dr. Taylor says that he examined them carefully when they were first exhibited in London, when he seems to have diagnosed the intimate abdominal connection between them, which has since been proved to have existed, though he erred in thinking that they possessed a common peritoneal cavity. Two cases, which would formerly have been cited as instances of early foetal maturity, are, as we think, very properly classed among superfœtations. They seem so distinct, and are derived from such indisputable sources, that we give them in extenso, although they are not new.

"1. William, first Baron Auckland, married Eleanor, second daughter of Sir Gilbert Elliot, Bart., and sister of Gilbert, first Earl of Minto, by whom he had fourteen children: amongst whom the fourth was the Hon. Caroline born on the 29th July, 1781, who lived sixty years, and the fifth the Hon. William Frederick Elliot, who was born on the 19th January, 1782, and survived twenty-eight years. The interval between the two deliveries was 174 days, and, allowing that fruitful intercourse took place a week after the first delivery, this would leave 167 days for the birth of a child showing its powers of life by reaching the age of 28 years. This is thirteen days less than the period fixed by experience for the rearing, and forty-three days less than the period assigned by Dr. Hunter for the gestation, of a child which could be born with sufficient strength to attain manhood. 2. Lord Cecil James Gordon, brother to the late Marquis of Huntly, married the eldest daughter of Maurice Crosby Moore, Esq., of County Tipperary, Ireland; and had a child, Evelyn, born on the 19th September, 1849, and a son, Cecil Crosby, born on the 24th January, 1850, both of whom are now living (1865). These dates leave an interval between the two deliveries of only 127 days; and deducting a week, the gestation of the second child, which has reached the age of 15 years, would be only 120 days, or four calendar months."

Dr. Taylor is disposed, vol. ii. p. 230, to allow large latitude to the duration of gestations, in opposition to the position of many medical jurists. In England the courts have recognized a pregnancy lasting forty-three weeks, and in this country a gestation of forty-five weeks and three days has been admitted to be possible.

The subject of infanticide extends over one hundred pages, being very fully considered in all its varied medical and legal aspects. Much space is devoted to some so-called tests of live birth which are finally judged by our author to be no tests at all, while some other criteria highly esteemed by other standard writers receive no notice whatever. As a prominent instance of this fault, we observe that no mention is made of the condition of the ossific centre at the lower end of the femur, which Casper and others hold to be so important and trustworthy an index of foetal maturity. The docimasia pulmonalis is treated of at length and its great value vindicated.

The general impression left by a perusal of these pages is that infanticide is indeed contrary to law, but is at the same time a crime which judge, jury, and community alike, both in this country and Great Britain, too often unite in finding excuses for; insisting that its commission must be proved by evidence, against which no theoretical objections can be urged by a subtle attorney. While such is the tenor of public opinion, no wonder, that with a constantly increasing number of cases of this unnatural and heinous crime, but few convictions are reached—and we are

almost inclined to think it would be better to repeal existing statutes, and deny to the product of conception, that has not enjoyed some days of extra-uterine life, any rights which an adult is bound to respect — such a course would at least save much expense to the state. Dr. Taylor, however, thinks that by seeking a verdict of manslaughter rather than one of murder, justice would more frequently be done, and in this opinion he is supported by the result of several recent cases.

Rape and unnatural crimes are treated of with brevity, yet in a clear and practical manner, but the illustrative cases are too few, especially when rape upon adults is considered, concerning which subject of late years some valuable studies have been written and a few instructive cases recorded.

We pass over the subject of insanity, to which Dr. Taylor devotes one hundred and thirty pages, as one of too extended scope for the pages of this review, and also as being one in which general practitioners have little interest, as they are rarely or never summoned as experts in such cases.

There only remains the subject of life insurance, which has so grown of late years that it bids fair to soon have a large literature of its own. This portion of the work appears to have been rewritten and to have had much care expended upon it. The rules of some of the best European companies are given in full.

These rules are so rigid and the loop-holes so numerous, that we are impressed with the idea that the companies need never pay unless they wish to; the duty of self-preservation has indeed forced them to adopt stringent regulations, as the frauds practised upon them have been enormous, and the efforts to impose upon them have led to the perpetration of some of the most remarkable of modern crimes. Dr. Taylor's last chapter contains a record of some of these celebrated cases, a perusal of which will well repay the reader.

In taking leave of this work we feel that we have given but a slight idea of the value of its contents, which make it an invaluable aid to any student of the subject, and one which he cannot afford to do without. Where so much has been well done it may seem unfair to criticize slight defects, yet we deem it no injustice to admit that we have been disappointed to find so little reference made to the work of other authorities. This omission is especially noticeable with regard to Casper, who, in our opinion, has contributed more to enrich and establish upon a good foundation the science he so well taught than any other writer.

Dr. Taylor's style is plain and ungarnished, but always clear, and his meaning cannot be mistaken. We confess to a partiality for big books, and as we lay these volumes down we feel indebted to their author for many pleasant hours spent in reading them.

S. A.

ANALYTICAL AND BIBLIOGRAPHICAL NOTICES.

ART. XXI.—1. *Transactions of the Obstetrical Society of London*. Vol. XV. For the year 1873. 8vo. pp. lx., 309. London: Longmans, Green & Co., 1874.

2. *Proceedings of the Dublin Obstetrical Society*. For session 1872-73. 8vo. pp. xvi., 202. Dublin: Fannin & Co., 1873.

THE Obstetrical Society of London numbered, January 1, 1873, 634 members, and held ten sessions in the year, with an average attendance of 34 Fellows and 5 visitors, the extremes being 19-3, and 53-17. It is, therefore, no exception to the rule, that a working society has but a moderate attendance; and it will also be found that a few busy men do most of the work, and find time to be present, when others, less occupied, *cannot possibly* attend.

The first article of the London *Transactions* is chiefly of local interest, as it applies particularly to the fatality under obstetrical practice by English midwives, and shows the importance of having such women educated by compulsion of law, for the protection of the poor who come under their care. This question will be found fully set forth in *Aveling on English Midwives*; and is one which will no doubt have to be considered with us at some future day.

Partial Severance of the Cervix of a Prolapsed Uterus, by a Ligature of Matted Pudendal Hairs. By N. COATES, L.R.C.P.—Married woman of 60; never pregnant; had prolapsus with partial protrusion of cervix for four or five years; was attracted to her condition by profuse hemorrhage after sitting on the stump of a tree, which pressed upon the protruding, strangulated mass, then as large as a walnut. The ligature, upon being cut through and removed, was found to have caused an ulceration into the neck, and to constitute a ring about the diameter of a pen-holder. It was no doubt formed of hairs from the labiæ, matted around the protruding cervix by the vaginal discharges.

The Address of Dr. Edward John Tilt, the incoming President, is mainly congratulatory, and recommends that in the future more attention should be paid to reporting cases of disease in women and children.

Case of Delivery by the Forceps in Face-presentation in Mento-lateral Position. By J. BRAXTON HICKS, M.D., F.R.S.—Mother in labour twenty-four hours when called in; face driven down partly into cavity of pelvis, in an exactly transverse position, with chin to left side. Long curved forceps applied in antero-posterior diameter of pelvis, with considerable difficulty for want of space anteriorly. Efforts made during traction to rotate chin forward, but to no purpose; face emerged transversely, as it had entered; pelvis presumed to have varied from the usual type. Child dead; occipital bone driven under the parietalia; vertical diameter of head not particularly reduced. Dr. Hicks was not conscious of exerting any great amount of power in traction.

Case illustrating the Treatment of Post-partum Hemorrhage by the Intra-uterine Injection of Perchloride of Iron. By HEYWOOD SMITH, M.D.—Woman aged 30; patient in British Lying-in Hospital; had had two children and four

miscarriages, with severe floodings in all the premature deliveries. Delivered January 26, 1872, after twelve hours' labour, of a full-grown male fœtus, with no unusual loss. Doing well for several days. On 9th day some hemorrhage, and passage of several clots; no apparent cause. Ergot administered. On 10th day injected into uterus one part strong liq. ferri perchlor. to eight of water. 16th day, bleeding not arrested, although lessened; injection repeated 18th; hemorrhage recommenced during night; injection one part to four. 20th day, injected equal parts. No bad symptoms after any of these trials; no pain; slept well. 21st day, strong liq. ferri injected from a f3ij syringe; followed by severe pain, referred to fundus. No more hemorrhage. The loss never amounted to a flooding, but oozed continuously, ceasing after each injection, and recurring generally only a short time before repeating the injection. Woman became violently sick, with vomiting, rapid pulse, delirium, distended abdomen, fever, and exhaustion. Died on 28th day. The uterus, on removal, measured five inches in length, nearly four wide, and walls three-quarters thick. Anterior and posterior surfaces marked with blackish streaks, evidently indicating the course of the uterine sinuses. The cavity, upon being laid open, showed that these were filled with black fluid, and their walls stained dark. A fragment of placenta, of the size of a filbert, was found retained. Space will not permit our giving a more minute anatomical description. Dr. Smith sums up the case as follows:—

"1. That post-partum hemorrhage, happening after complete contraction of the uterus, and therefore after the uterine sinuses have been emptied of blood, is evidently arterial.

"2. That when a solution of perchloride of iron is injected into the uterus, the sinuses take it up and carry it into the veins; the tissues also immediately surrounding the sinuses becoming stained.

"3. That the perchloride of iron does not produce contraction; nor, by coagulation of blood, blocking of the orifices of the uterine arteries; and,

"4. That the perchloride of iron is a styptic, the use of which in the cavity of the puerperal uterus is not innocuous."

A long discussion followed this paper, from which we extract the following opinions:—

1. That in obstinate hemorrhage, such as reported, the presence of a portion of placenta should be suspected, the uterus dilated, and the foreign substance removed.

2. That the solution employed is a valuable one, and has saved many lives, but cannot be used with safety unless very much diluted. •

3. That the procedure should be employed only after other means have failed in causing uterine contraction and arresting hemorrhage.

Dr. J. J. Philips admitted the danger, but believed in the propriety of using a moderately strong solution, after removing any fragment of retained placenta, as desperate cases were in more danger from hemorrhage than the remedy employed. He had not noticed any severe pain after using the styptic. In one case he had met with, profuse hemorrhage occurred from a fragment of placenta being retained, on the 21st day; and, in another, not for five weeks.

At the next meeting the discussion was again entered upon, and at much greater length.

Dr. Snow Beck believed in there being great danger from the injection of styptics soon after delivery. The results appeared to be, that the hemorrhage continued with no ill consequence; that it ceased, and the woman either recovered fairly, or after a lingering convalescence; or that she appeared well two or three days, then became weak; pulse 130 to 160; abdomen tender and tympanitic, followed by vomiting, diarrhœa, peculiar delirium, and certain

death. He examined the uterus of Dr. Smith's patient, and found the utero-placental arteries open in many instances, and their canals free from coagula. He believed that the styptic was taken up by the veins, carried into the circulation, and thus caused death. He advocated the use of ergot, cold, compression, etc., and believed that failure was due rather to the mode of use than want of power in the remedies.

Dr. Bantock had produced death in seven or eight hours from a perchloride injection. He advocated early and long-continued compression of the uterus, so as to prevent inertia, and insure contraction.

Dr. Wynn Williams preferred applying the perchloride on a sponge introduced with the hand into the uterus, and to be removed as the organ contracted under its influence. He believed it quite as efficacious as the injection, and at the same time free from its risks.

Dr. Protheroe Smith recommended the substitution of the tincture of matico, which he had frequently used.

Dr. Barnes strongly advocated the use of the perchloride as the only reliable remedy in desperate cases, particularly in delicate, exhausted subjects; and believed that death, attributed to the remedy, might often be traced to exhaustion, shock, etc. The general opinion of the Society was rather in favour of the use of the perchloride.

Progress of Pelvic Pathology during the last Twenty-five Years. By EDWARD J. TILT, M.D.—As seventeen pages of the volume are occupied by this paper, we can only refer to the "Propositions," which, he says, contain the pith of his work on *Diseases of Women and Ovarian Inflammation*, published in 1850, and which, he contends, have only been substantiated by the test of time, viz.:—

1. "The admitted frequency of inflammatory lesions in the ovaries and in the surrounding peritoneum is of much greater practical import than is generally admitted.
2. "Of all inflammatory lesions of the ovary, those involving destruction to the whole organ are very rare, while the most numerous, and therefore the most important lesions, may be ascribed to a disease that may be called chronic, or subacute ovaritis.
3. "As a rule, pelvic disease radiates from morbid ovulation.
4. "Morbid ovulation is the most frequent cause of ovaritis.
5. "Ovaritis is the chief cause of pelvic-peritonitis.
6. "Blood is frequently poured out from the ovary, and from the oviducts into the peritoneum.
7. "Subacute ovaritis not unfrequently causes and prolongs metritis.
8. "Ovaritis often leads to considerable and varied disturbance of menstruation.
9. "Some chronic ovarian tumours may be considered as aberrations from the normal structure of the Graafian cells."

On the Pathology of certain so-called Unilocular Ovarian Cysts. By GEORGE GRANVILLE BANTOCK, M.D.—The nature of the peculiar cystic disease in question is best shown by reference to a specimen exhibited, and described as follows: "It consists of the uterus and its appendages as they were removed from the body of a patient æt. 16." Ovary healthy on right side. In the fold of peritoneum between this ovary and Fallopian tube, that peculiar organ, the parovarium, or organ of Rosenmüller, is plainly seen. At its outer angle, nearest the tube, you will observe a small cyst, about as large as half a field bean, evidently originating in one of the tubules of the organ. On the left side, ovary also healthy; parovarian cyst as large as the ovary. Of the size of such cysts when developed the author says: "It has gone forth

stamped with the high authority of West, that parovarian cysts never attain a greater size than that of an orange, and I cannot allow it to pass without a few words." He then argues, that from the situation of the cyst, its vascular supply, the thickness of its walls, and nature of its contents, there can be no limits to its dimensions, or liability to rupture from distension. He opposes the idea of Dr. Meadows, on anatomical grounds, and denies the possibility of the cyst having originated in the hilum of the ovary. He also says that all unilocular cysts in the neighbourhood of the ovary, or involving it by contact, though leaving it healthy, are of parovarian origin; and that there is no such thing as true unilocular or unifollicular disease of the ovary, except in its earliest stage.

1. *Case of Extra-uterine Pregnancy; Gastrotomy successfully performed*, by WILLIAM ROSS JORDAN. 2. *Case of the same*, by JOHN SCOTT, F.R.C.S., with operation. 3. *Case of the same*, by ALFRED MEADOWS, M.D.—These three cases have been already noticed in the number of this Journal for July, 1873, p. 276-8.

Hypertrophic Elongation of Cervix Uteri at Full Term of Pregnancy. By GEORGE ROPER, M.D.—Primipara, age 22; cervix protruding about three inches, and thick as a man's wrist; whole length about four inches; canal size of index finger; structure hard and firm; been in labour thirty-six hours; some expansion of neck above. After four more hours made seven incisions in os externum at equal distances, and extending an inch and a half within; gradual expansion for sixteen hours; used forceps; child living; recovery as after ordinary labour. Two months after delivery found cervix proper but slightly larger, or longer than natural; hypertrophied extension soft and flabby like a prepuce—this was removed. Woman has had several children since, with easy labours. Removal of elongated cervix after involution necessary, to avoid a repetition of development, with the same trouble in after pregnancies.

Case of Complete Uterus Bicornis; the septum extending into one common cervix; Pregnancy of Right Horn; Turning and Extraction on account of Pelvic Contraction, the conjugate diameter measuring only two and a half inches. By E. H. M. SELL, M.D.—Chiefly interesting from rarity. Woman single; thirty-one; Bohemian. Professor Braun diagnosed *uterus bicornis*. Right impregnated; left containing protruding decidua. Child female, four pounds and fourteen ounces; asphyxiated; restoration after half an hour's work by means of artificial respiration, frictions, sprinkling with cold water, etc.; discharged in thirteen days.

Diagnosis of Subacute Ovaritis. By EDWARD JOHN TILT, M.D.—This paper was noticed in the number of this Journal for January last, p. 275.

Necrosis of Ossa Pubis following Delivery.—Dr. PLAYFAIR exhibited a specimen of this rare form of puerperal disease, remarking that two, reported by Trousseau, were all that he had found recorded. The specimen came from a young primipara of 23, who had good health until the time of her labour, which was easy and natural. Three weeks after delivery an abscess burst at the anterior portion of the left labium minus, and discharged a small quantity of offensive pus; after which she had pain and tenderness in left inguinal region, with inability to straighten the corresponding thigh. There was an offensive purulent discharge from the vagina; left thigh became œdematous at its upper part, ending in abscess. Died of exhaustion in nine weeks after delivery.

Pubic bones found entirely necrosed, and symphysis disintegrated and destroyed, from which extended a large sac partly filled with pus, and communi-

cating with the vagina, and also the left groin, where there were openings by which it discharged.

Dr. Playfair believed the disease to originate in some obscure form of septi-cæmia, giving rise to a low form of inflammation in the bones and periosteum.

Two Cases of Extra-uterine Fœtation. By D. C. McCALLUM, M.D.—1. In fourth month of pregnancy attack of indigestion, with vomiting, resulting in rupture of a tubal cyst, followed by death in about three-quarters of an hour. Large amount of blood in abdomen; uterus enlarged, and inner surface covered with a well-marked decidua.

2. Rupture at an early period; intense abdominal pain, followed by symptoms of collapse. Patient believed to be in second month of pregnancy; treated with opium and stimulants; recovered slowly in two months. Had had four children; became again pregnant, and was delivered seventeen months after the attack.

These reports remind the reviewer of two somewhat similar cases in his own practice. The first was tubal, in the first month, and death resulted in twenty-three hours. The second was also very early, and the patient, after going down as near to death as I have ever seen one to do that did not actually die, recovered slowly, has since borne another child, and is now quite robust. In the first case the mother was menstruating at the time of the accident, which resulted from pressure exerted in ascending a stairway. The cyst was about the size of a common plum, and the rupture that of a quill.

The Use of Intra-uterine Stems in Uterine Disease. By C. H. F. ROUTH, M.D.—As this is a question which has recently excited considerable notice, we will endeavour to give the important points of the article.

Intra-uterine pessaries have been much abused, and their use condemned; but experience has shown that their use is advantageous in many cases when properly applied.

1. "All inflammatory or congestive symptoms about the uterus or ovaries should be first treated and removed," many of the accidents, such as abscesses, metritis, and even peritonitis being due to the neglect of this precaution. If the slightest pain is felt in passing the sound, and if this is especially marked at the fundus, it is dangerous to use the stem until after treatment shall have removed the difficulty.

2. "It is important in some cases to enlarge the uterine canal." For this purpose carefully cleansed and dried sea-tangle tents are recommended, as having much more power of expansion than sponge; or the hysterotome may be required.

"There are four classes of cases in which the intra-uterine pessary should be employed, viz., in cases of membranous cervix; certain cases of amenorrhœa; also of dysmenorrhœa, whether mechanical or simply neuralgic; and in uterine flexions."

These points in the use of the stem pessary are all illustrated by reports of cases benefited by its employment. Dr. Routh never introduces a stem more than two inches long, except where the uterus is preternaturally elongated.

The discussion, after the reading of the paper, showed that there was a great diversity of opinion upon the value and innocence of the stem-pessary.

2. *The Dublin Society* has had an existence of thirty-five years, and numbers 142 members.

On Endo-metritis.—The paper of LOMBE ATTHILL, M.D., is a full and valuable clinical one. The *symptoms* enumerated are: Leucorrhœa, pain, dysmenorrhœa, or sometimes irregular menstruation, menorrhagia, and reflex irritation. The *physical signs* are increased length; size of the cavity of, and

bulk of the fundus of, the uterus; increased sensibility of the mucous membrane lining the cavity of the organ; a patulous os internum, and often an abnormally sensitive condition of the mucous membrane at that point; displacements anteriorly or posteriorly of the fundus resulting from increase in size and weight.

Dr. Atthill recommends local depletion by punctures of the cervix; dilatation by sea-tangle tents, and subsequent application of fuming nitric acid to the uterine cavity; and the introduction of a piece of solid nitrate of silver, which is allowed to remain. He condemns the use of liquid injections as dangerous, but regards the fuming nitric acid as free from risk. He has invented an intra-uterine speculum to be used after dilatation, and through which he makes his applications.

On the Constitutional Character and Treatment of the Diseases of Women, connected with Chronic Inflammation of the Uterus. By THOMAS MORE MADDEN, M.D.—“Chronic inflammation of the neck of the womb is the most common of all the diseases peculiar to women.” Of 6300 cases of diseases of women in dispensary practice, rather more than one-tenth were of this class; and the proportion in private practice is fully as large as in hospital or dispensary experience.

The author believes the apparent increase of uterine diseases to be due to the fact, simply, of their more ready detection since the revival of the use of the speculum; and whilst using the instrument to a great extent, regards it as justifiable only where absolutely demanded for diagnosis and treatment. He objects to the use of Sims's duck-bill speculum in ordinary cases, and especially to the employment of his tenaculum in drawing down the uterus. He believes the tactile sensation sufficient for diagnosis in most instances, and regards the speculum as mainly of value in treatment.

Sterility almost always accompanies chronic cervical inflammation, and as long as it exists to any serious extent the patient must remain barren; and it is useless to attempt to remedy this condition by any form of surgical operation.

In the majority of instances of supposed heart-disease in women, and especially in hysterical subjects, he believes the symptoms due to uterine inflammation, and to be removable by its cure. He regards chronic inflammation of the uterus, and its results, including ulceration, as a consequence of a coincident constitutional disease, and, therefore, not to be cured by local measures except in rare instances. As constitutional remedies he recommends cod-liver oil, preparations of iron, and iodine; quinia, and mineral waters; believing the disease, in many instances, to have a strumous origin, and, in some, a gouty, rheumatic, or syphilitic one, and to require a corresponding treatment proper for such maladies.

Dr. Madden gives the credit of first applying the solid nitrate of silver within the cavity of the womb to Dr. Kennedy, of Dublin (1847); to Dr. Denham that of leaving a portion in the uterine cavity; and to Dr. Kidd that of dilating the cervix with sea-tangle tents, and applying fuming nitric acid in intra-uterine affections—all of them Presidents of the Dublin Obstetrical Society. He highly recommends, in congestion of the cervix, the application of a ball of cotton saturated with glycerine, as employed by Dr. Sims. He employs, for simple ulceration of the cervix, strong tincture of iodine, applied twice a week; and, when there is suspicion of syphilitic origin, the nitric acid. He does not recommend the use of potassa cum calce, or caustic potash, as they are difficult to limit in action, and may produce acute metritis. For hyper-

trophy of the cervix he prefers, in most instances, iodine dissolved in glycerine, to any destruction of the part by escharotics.

On Dactylitis Syphilitica, a specific affection of the Fingers and Toes. By J. MOYAN, M.D.—This peculiar form of inherited syphilis appears to manifest itself at a later period than the more usual types of the disease. Dr. Moyan exhibited casts taken from the parts affected, showing their globular form, and looking as if the thumb were thrust through an India-rubber ball. He reported the case of a child whose mother had given birth to two healthy children, then been syphilized by her husband, and produced the infected subject. The enlargement, after some time, became coloured on the surface, then tense, and of a purplish-red; and, when opened, gave exit to a thin fluid, under which gummatous matter appeared. The disease affected a foot and one thumb, and was seven months getting well. Another case was in a boy of nine years of age; and a third in one of eleven, which was a very severe one. He had eight marks of gummatous suppuration from time to time.

Dactylitis generally occurs in the first joint of a finger, and on the dorsal, rather than the palmar aspect. The skin is at first whitish, very tense, and has a creaking sensation; but afterwards becomes coloured, as before mentioned.

"It was a disputed point whether the father could produce a syphilitic child without affecting the mother: but the influence of the mother beyond yea or nay was very potent. He saw a case of a mother producing a healthy child, and the child remaining healthy for two years. The mother was one of the worst cases of syphilis in the hospital, and was under treatment in it for two years. The child did not show any signs of syphilis until the end of two years, and then it showed severe syphilitic taint." p. 102.

Treatment of Vesico-vaginal Fistula, with loss of Urethra, Neck, and Floor of Bladder. By GEORGE H. KIDD, M.D.—After speaking of the difficulties and unsatisfactory results of the operations of Jobert and Baker Brown, the former closing the vulva, and making an opening into the rectum; and the latter making a new urethra under the arch of the pubis above the old one, and then drawing down the uterus, and bringing the sides of the vagina together, Dr. Kidd reports a case where he closed the vulva, leaving a long, narrow passage close to the pubes, which might answer the purpose of the urethra, and enabled the woman to retain her urine by means of a spring truss-like compressor, after the description of Trélat, of Paris, as shown in the *Gazette des Hôpitaux*, Dec. 30, 1865.

Drs. Atthill and Johnson performed similar operations with success, the latter at the suggestion of Dr. Kidd. In Dr. Atthill's case a part of the urethra was left.

Epilepsy during Menstruation from Occlusion of the Vulva, cured by Operation. By Dr. MORGAN.—The subject of this was a single woman, æt. 22, strong, and well developed; occlusion from sloughing, following fever. Cicatricial web excised; parts kept separated by a tent until healed over; epilepsy ceased.

This case is of interest when compared with those reported by Dr. Sayre, of New York, where three boys were cured of partial paralysis, resulting from reflex irritation, by circumcision of a congenital phymosed prepuce in each instance. The affection of the nervous system, although of a different type, was no doubt due to reflex action from the same system of peripheral nerves in the woman and boys.

Cases of Amenorrhœa from Congenital Malformation. By FLEETWOOD CHURCHILL, M.D.—These are instances of the effect of defective sexual de-

velopment upon ovulation, menstruation, sexual passion, and the external marks and contour of womanhood, which may be summed up as follows, viz. :—

1. Sexual passion indicates, even without menstrual discharge, the presence of at least one ovary.

2. The absence of such passion is no proof of the want of ovaries, as multiparæ not unfrequently have never had any sexual gratification.

3. Where the want of this passion is associated with a want of mammary development and womanly contour, it is to be presumed that the ovaries are undeveloped.

4. Menstrual epistaxis is believed to be generally associated with ovulation.

Dr. Ringland related a remarkable case of unilateral development. The woman was 20, and had never menstruated. She had no clitoris, vagina, or uterus; the urethra being close to the anus. She had an ovary on the left side; left breast was developed; hair on pubes only on that side, and left labium alone developed.

Dr. Kidd was of the opinion that in some instances the uterus and ovaries remained inactive, or were in an infantile state, which might be remedied by the galvanic pessary, stimulating them into development or activity.

Chronic Inversion of the Uterus. Case of five months' standing reduced by GEORGE H. KIDD, M.D., and one of seven months by G. JOHNSTON, M.D.—In both cases the inversion resulted from traction upon the cord, and each was subject almost continually to hemorrhage. The reduction was effected by grasping the uterus, and, by degrees, forcing it through the os, the woman being under the influence of chloroform. Dr. Johnston states the time required in his case as twenty minutes; Dr. Kidd as five to ten. Both made good recoveries.

Dr. McClintock reported a case where he had made three attempts at reposition, but failed, although it seemed to be at first a favourable case, the bulk of the uterus not exceeding that of a walnut. He subsequently amputated the uterus, and the woman recovered. After removal the uterus could not be re-inverted without using force sufficient to lacerate it. Several instances were reported of pregnancy in cases of reduced inversion.

Diagnosis and Treatment of Uterine Polypi. By THOMAS MORE MADDEN, M.D. :—

"The distinction made between intra-uterine tumours and intra-uterine polypi is quite untenable, as their structure is identical; either may be encapsuled, and their symptoms cannot be distinguished. In fact, an intra-uterine fibroid polypus is but a more advanced stage of a submucous tumour which has lost its sessile form from its own weight, as it grows downwards, becoming constricted at its point of projection from the uterine wall, so as to constitute a pedicle."

Symptoms.—Menorrhagia, or persistent metrorrhagia, and profuse or foetid leucorrhœa; a sense of weight from the enlargement of the uterus; pain, from a mere soreness or dull aching in the lumbar region, to the most intense uterine colic; pressure on the bladder or rectum from displacement of the uterus; and impairment of the patient's health from the hemorrhagic and leucorrhœal discharges.

Treatment.—Removal of the polypus either without or after dilatation of the cervix, as may be necessary; and the application, subsequently, of strong nitric acid on cotton, followed by tepid vaginal injections twice a day of infusion of chamomile. Where surgical treatment is impracticable, or will not be submitted to, Dr. Madden recommends the use of bromide of ammonium or potassium, and small doses of tincture of iodine, to be persevered with for some

months at a time; the local application of iodine to the tumour, and tepid or cold injections by means of a uterine douche.

Dr. Kidd said he had never seen much benefit from medical treatment. He thought that chloride of calcium made patients more comfortable than any of the drugs recommended, but had never seen it cause absorption of the tumour.

Dr. Churchill held the same views. He referred to the great danger of dilating the *internal os uteri* with a tent.

Dr. Atthill spoke of the dangers of using cold water injections into the vagina, and the risks to be run by dilating the cervix for repeated applications to the tumour. He recommended that they should be made through a tube.

Ovarian Dropsy, with Unusual Quantity of Fluid. By Dr. E. G. BRUNKER. —The subject of this case was married at 40; circumference of abdomen sixty-three inches; breathing free; slight emaciation; functions of bowels and kidneys healthy; size increasing for some years; gave birth to a healthy child a year before; occasionally menstruates. Ten gallons of dark, oily fluid drawn off; no distinct tumour to be felt. Recovered rapidly. Ten gallons of similar fluid, but lighter in colour, again removed in ten and a half months. In interval says she led an active life, enjoyed good general health, and menstruated at irregular intervals. Still under care when reported.

ART. XXII.—*The West Riding Lunatic Asylum Medical Reports.* Edited by J. CRICHTON BROWNE, M.D., F.R.S.E. Vol. III. 8vo. pp. vi., 349. London: Smith, Elder & Co., 1873.

IN the Journal for January, 1872, we gave an account of the objects of this publication, with a notice and abstract of the essays which made up its initial number. A year later we noticed the second annual volume. The present collection consists of fourteen articles of very diverse merit.

The first paper is by WM. TURNER, M.B., Professor of Anatomy in the University of Edinburgh. It is styled *The Convolutions of the Human Brain considered in Relation to the Intelligence*. We find first a *resumé* of known facts as to the weight of the brain in different races, sexes, and individuals. A description of the convolutions follows. Speaking of the relation between high intelligence and well-marked convolutions, the writer admits that the concurrence of the two, though common, is by no means constant or without striking exceptions. In certain lower animals, too, greater intelligence exists in species with smooth brains than in others whose cerebral surface is convoluted. Should it be suggested that the thickness of the cortical substance might be the test and measure of cerebral activity, the writer would reply that in some localities, and some individuals, the proportion of cerebral cells to connective tissues is greater than in others. These cerebral or nerve cells, too, differ in size among themselves. The author seems inclined to believe that the largest of these are the most efficient. Vascular supply, everywhere needed to insure proper functioning, must influence cerebral activity, by its quality and its amount.

Having thus directed attention to conditions other than mere bulk or extension, the writer reviews the chief arguments of those who believe that different powers and faculties are localized in certain definite convolutions. Proof of such views he thinks is still wanting. Believing that the object of the convoluted structure is to increase the amount of gray matter, and of the peculiar

cells which it contains, he does not believe that diversity of function can be ascribed to different convolutions. The proper direction of research, for those who seek to establish localization, he thinks should be to show by microscopic evidence, some persistent and characteristic differences in the cells of different localities.

The second essay on *Experimental Researches in Cerebral Physiology and Pathology*, by Dr. FERRIER, has already been noticed in our pages.

Dr. HERBERT C. MAJOR, who has before recorded valuable microscopic observations, continues work in this direction, and here records the results of examination in a number of diseased brains. The style of this paper, on the *Histology of the Brain in the Insane*, is such as to inspire us with great confidence in the care, skill, and judgment, of its author. Good, honest work, such as shall afford trustworthy material for future generalizations, seems to be his object, rather than the attainment of notoriety, or making a sensation. Its modesty and candor make the article a model of its kind.

Dr. J. MILNER FOTHERGILL furnishes a paper on *The Heart Sounds in General Paralysis of the Insane*. Having noticed, almost by accident, some peculiarity in the cardiac sounds in several patients affected with paresis, he was led to extend his observations, when he met with results wholly unforeseen. Out of fifty-five cases auscultated, forty-four presented a decided increase or "accentuation" of the second or aortic sound. This same peculiarity, he reminds us, has been pointed out as a most frequent symptom in chronic Bright's disease. Seeking for an explanation of this feature common to four-fifths of the general paralytics, Dr. Fothergill finds but one condition, capable of causing the phenomena, which could be supposed to be thus generally present. This condition he believes to be increased vascular area, and consequently increased blood supply, throughout the cerebro-spinal system. The larger and heavier column of blood above the valves causes their more forcible closure. To support this view he examined several cases of active mania in which cerebral hyperæmia was believed to exist, and actually found a similar alteration of the second sound. Moreover this accentuation diminished when the patients were made to lie down. Evidence is also adduced to prove the existence of distended cerebral bloodvessels in the early stages of paresis; and the writer believes that, later, the obstructive influence of degeneration would have the same effect on the second sound.

The possibility of very considerable variation in the amount of blood contained in the brain, is believed, by Dr. Fothergill, to be due to corresponding inverse change in the serum occupying the peri-vascular canals.

Unlike another contributor to this volume, Dr. Fothergill deems insanity rather antagonistic than favourable to heart disease. He approvingly quotes Griesinger, to the effect that "affections of the heart are rather rare than frequent in the insane."

Dr. T. W. McDOWALL, a resident of the asylum, makes a beginning in this number, of what promises to be a somewhat elaborate investigation into the *Power of Perceiving Colours, possessed by the Insane*. In the resumé here given of our knowledge upon the general subject of colour discrimination, the writer adverts to the scarcity of authorities. The subject has been thoroughly treated, he says, but the works upon it are shut up in foreign libraries. Although Dr. McDowall's personal inquiries are as yet not much more than begun, he has already found reason to believe that much curious and novel truth may be elicited by this investigation.

A practical paper upon the *Nitrite of Amyl in Epilepsy* is the work of Dr. BROWNE, chief of the asylum, and editor of the Reports. Some experiments here

recorded having indicated that epileptics were peculiarly susceptible to the action of this drug, and that action seeming to be in some respects the reverse of what takes place during an epileptic seizure, the idea not unnaturally suggested itself to Dr. Browne, that the nitrite might be of service in warding off paroxysms of epilepsy. Without meaning to dogmatize as to the nature of the seizure, the writer believes that there always occurs, at its commencement, an intense contraction of the cerebral bloodvessels. As the inhalation of the drug causes vivid and extensive blushing, owing to capillary dilatation, it would seem not unlikely, given at the right moment, to prevent or lighten a fit. And so it has proved. In a case where the fits occurred daily, inhalations three times a day postponed them for nineteen days. Though the seizures reappeared upon partial abandonment of treatment, yet, later, they were quite infrequent when medication was wholly given up. The night attendants upon epileptics were now provided with the medicine, and instructed to administer it to any patient in whom they noticed the signs which experience had shown to be the precursors of a fit. To the surprise and pleasure of Dr. Browne, it was found that not only were seizures prevented by treatment of the prodromata, but that convulsions actually begun were nipped in the bud, cut short, and arrested. In that terrible state known as the *status epilepticus*, inhalation of the nitrite was tried with the best results. The drug seemed to possess the power absolutely to break up the morbid habit. Unless the writer has deceived himself, as well as his readers, we must believe that the nitrite saved several lives under his observation.

We regard this paper as one of the greatest importance. The moderation of the writer in not claiming curative power for the nitrite of amyl, gives the greater weight to his opinions as to the value of the drug, in preventing suffering, and saving or prolonging life. We may be mistaken, but we cannot help thinking, that the nitrite of amyl is destined to work a revolution in the treatment of epilepsy. We cannot avoid indulging a hope that this drug, added to ordinary judicious medical treatment, may be found adequate to the complete control of epileptic fits. Whether it can prevent the manifestation of the constitutional weakness in some way, is a different question.

Dr. J. HUGHLINGS JACKSON contributes a paper entitled *Observations on the Localization of Movements in the Cerebral Hemispheres, as revealed by Cases of Convulsion, Chorea, and "Aphasia."* We must confess our inability to catch the drift and intention of this article. Other readers, however, may be more quick of apprehension.

Dr. JOHN LOWE furnishes an article *On Electro-excitability in Mental and Nervous Diseases*. The special object which he has kept in view in the observations here recorded, is to ascertain the diagnostic uses of electricity in nervous and cerebral diseases. So far, he very candidly admits, this investigation has borne but little fruit. With the hope of eventually reaching some results of value, he proposes to continue the very arduous and tedious experiments which he has begun.

A long paper by J. WILKIE BURMAN, M.D., on *Heart Disease and Insanity*, embodies the results of great labour and extensive research. We would be glad to believe the results obtained are proportionately valuable. The writer starts with the idea, that as insanity is on the increase, while "heart disease," as a cause of death, appears in slightly increasing proportion in the mortality tables, there is, therefore, probably some connection between the two. Confirmation of this surmise is obtained in the following manner: The counties of England and Wales are divided into two groups, in one of which are all those wherein mortality from heart disease is above the average, and in the other

those wherein it is below the average ; and then our attention is directed to the startling fact that the proportion of lunatics to the thousand inhabitants is 2.34 in the first group, and but 2.14 in the second ! The importance of this result may be better appreciated when the reader is informed that the ratio varies among these counties, from 3.3 down to 1.3.

Dr. Burman believes that after making due allowance for the greater age of hospital patients, as compared to the population at large, there is still an excess of heart disease among the former class. We believe, however, that it is and must be, impossible numerically to determine just what allowance should be made for the different circumstances of the two classes ; and that therefore no trustworthy results can be attained in this matter by the use of figures. Our readers will notice, by turning back a page or two, that Drs. Fothergill and Griesinger hold an opinion precisely opposite to Dr. Burman's.

The large number of hearts carefully examined and weighed at the West Riding Asylum, some five hundred, certainly indicate the general prevalence of some degree of hypertrophy. The male hearts averaged 12.62 ounces, and the female, 10.26 : the normal standards being, according to Reid, 11 ounces and 9 ounces. Yet the writer admits that in over 500 insane dying in the Somerset Asylum, the heart-weights were decidedly different, male hearts being 11.14 ounces, and female 8.67. The proportion of perfectly healthy organs among those recorded at the West Riding, was only one-fifth. Among 680 living male patients, signs of cardiac disease were found in 44 per cent. This certainly is a very different state of things from that indicated by Dr. Fothergill, when he speaks of heart-disease as "somewhat rare among the insane."

Dr. Burman's paper is very elaborate and complete. It contains the record of very numerous observations, professes to indicate the comparative frequency of cardiac affection in different forms of insanity, and the various forms and degrees which that affection assumes. Yet, in view of the very ill-grounded assumption with which it begins, and the directly opposite testimony of other observers, we cannot give to it that measure of confidence which we could wish.

Notes on the Condition of the Tympanic Membrane of the Insane is the title of a paper in which Dr. JOHN C. GALTON, a clinical assistant at the Asylum, announces the object, method, and first results of a new line of investigation by him commenced. The idea seems to be that the visible engorgement of certain vessels in the external or cuticular layer, and the internal mucous coat, of the membrana tympani, affords an indication of cerebral hyperæmia similar to that often derived from ophthalmoscopic observations.

The observations so far made tend to show that a dilated condition of these vessels is common in confirmed epileptics ; and that such condition can be produced, frequently, by the inhalation of nitrite of amyl, in healthy subjects.

The writer very judiciously points out certain particulars in which this physical examination is freer from disturbing influences than that of the retina. No pain, affright, or suddenly increased stimulus to the organ, here occurs to affect the correctness of the observation.

Dr. ALBUTT, a contributor to preceding volumes, furnishes a brief article upon the *Obscure Neuroses of Syphilis*. A few new illustrative cases are presented, but no new truths are elicited.

W. C. S. CLAPHAM, Esq., has compiled from the records of the Asylum the statistics concerning the *Weight of the Brain in the Insane*. Averages of some 700 brains are given according to age, character of disease, and nationality.

The Change of Life and Insanity, by HENRY SUTHERLAND, M.D., is chiefly valuable for its presentation of the facts and conditions concerning some one

hundred female patients of the Asylum, attacked with insanity soon after this epoch.

The volume is completed by another essay by Dr. J. H. JACKSON *On the Anatomical, Physiological, and Pathological Investigation of Epilepsies.*

B. L. R.

ART. XXIII.—*Transactions of State Medical Societies.*

1. *Transactions of the Indiana State Medical Society*, 1873. 8vo. pp. 142.
2. *Transactions of the Medical Association of the State of Alabama*, 1873. 8vo. pp. 112.
3. *Transactions of the Colorado Territorial Medical Society*. 8vo. pp. 56.

1. *Indiana State Medical Society*.—In the opening address by the President, we have some not uninteresting reminiscences of a professional career of forty-eight years in one county of Eastern Indiana. Dr. Pennington believes that a decided change of type has occurred in the diseases of his district. He is inclined to believe this to be in some way connected with the cholera epidemic of 1832. Inflammations, and the febrile symptoms of various diseases were much more intense and more sthenic before that period than now. Free bleeding, antiphlogistics, and mercurial purges, given in the hot stage of intermittent fever, would often, he says, completely arrest the disease, without a second paroxysm. Pleurisy and pneumonia were treated, with almost equal alleged success, by venesection and antimony. "We seldom lost patients from acute diseases. It would have detracted from the standing of a medical man should it have been known that he lost a patient from inflammation. He might lose a patient from sheer debility, and be excusable; but not from acute disease, provided he saw the case in an early stage of the attack." Pregnant admission! The patient had the melancholy satisfaction of knowing that his physician prevented (in the old sense) the natural termination. Notwithstanding his belief in a change of type, Dr. P. thinks that active treatment has been too much supplanted of late by the expectant practice. Brief notices of some of his contemporaries close this address of the President.

An obscure case, supposed to result from *infection with glanders*, is reported. Death occurred after eight months. An instance of protracted presence of a *foreign body in the ear* is narrated by Dr. WRIGHT. A bean was removed from the meatus twenty-two years after the patient (then a child) had placed it there. *Disease of the antrum*, with nervous symptoms, and *annually recurrent abscess in one eyelid*, are cases briefly reported.

Interesting articles discussing *arterial thrombosis* and resulting gangrene, each illustrated by an original case, are contributed, one by Dr. HOUGHTON, and another by Dr. BUTLER.

A report is presented embracing brief statements of health and disease in the different counties. The most noticeable point seems to be the general prevalence, during the cold and wet months, of cerebro-spinal meningitis. Mortality seems, so far as stated, to have been about one in four. Influenza was widely observed as following the epidemic horse-disease.

A case of *rupture of the uterus and vagina*, followed by recovery, has its value sadly marred by ungrammatical and incomprehensible expressions. Absence of any revision, by author or proof-reader, is apparently the cause, but not an excuse for this state of things.

In a notice of the Medical Society publications of some other States we recently ventured to use plain terms in characterizing some of the papers admitted into their volumes by too indulgent committees. We are sorry to say that two articles in this pamphlet are utterly unworthy of print. One of them is simply shameful. Grammar and orthography are outraged in nearly every line, and every possible literary vice is amply illustrated. It is a disgrace to the medical profession in America to allow such effusions to appear under the sanction of State medical societies.

2. The present volume of *Transactions* of the Alabama Association is principally made up of general reports from a few counties, and of the proceedings at the annual meeting, including the amendments then adopted to the constitution. The latter instrument, as revised, is printed in full in the last dozen pages of the pamphlet. We confess to a feeling of profound thankfulness when we discovered that the "Addresses" or "Orations" common to similar publications were here limited to one of each title.

The address of the President, Dr. GEORGE E. KUMPE, is thoroughly sensible and practical, wholly free from "fine writing" and "served eloquence." It deals briefly with matters of special interest to the physicians of the State, such as epidemics, legislation required, changes in the constitution of the Association, and medical education. We learn that it was upon Dr. Kumpe's motion that an admirable provision was six years ago inserted in the constitution requiring examination, before the censors, of any would-be student, prior to his admission as pupil into the office of a member. Attainments were specified corresponding to those resulting from a good high-school education, with fair acquaintance with English literature and composition. Without a favourable report from the censors, after such examination, no fellow of the Association could receive a student under penalty of six months' suspension. This rule, however, after serving an admirable purpose, has been modified, and we fear practically nullified, in the recent revision. The examination is put into the hands of the censors of *county* societies, and these are allowed ten years' delay before enforcement. Physicians entering the State *may* apply to the censors of the General Association; and the local societies are instructed to examine all new-comers, and withhold all professional recognition from such as do not pass. But this, again, contains the unfortunate "ten years" proviso. And no statement is made of the treatment of non-applicants for the examination. Thus, we are sorry to judge, a step has been taken backward.

Of the inevitable oration what need to speak? Suffice it to say, it is not quite so extreme a specimen as some we have attempted to characterize. Committees on publication should be taught that the profession hold them gravely accountable for that ill-judging easiness of disposition which alone can explain their acts.

In one of the county reports we observe that during ten years the physician writing had not met a single case of scarlatina. Rubeola, however, was common, and at times epidemic.

In a surgical report from Sumter County we find a case of the *removal*, for fibroid disease, of the *entire uterus and both ovaries*. In removing this mass, weighing over six pounds, the whole of the small intestine was lifted out of the abdomen to gain room. Five silk ligatures were applied to arteries, cut close, and allowed to remain. The cavity and bowels being carefully sponged with tepid water, the incisions were closed with silver sutures, covered closely and tightly with bands of adhesive plaster. The operation was attended with severe shock, and followed by violent vomiting. During a paroxysm of retch-

ing a knuckle of intestine protruded through the wound, and was slightly torn by a wire suture. The edges of the rent were fastened to the edges of the wound [printed *womb*] in the abdomen. Symptoms of pyæmia repeatedly occurred. On the tenth day clots and pus were discharged through an incision in the posterior vaginal wall. Incisions in abdomen, except at fistula, healed by first intention. Sutures removed on tenth day, but supporting plasters longer used. This patient fully recovered. Attempts made to close the fistula reduced it to dimensions not practically troublesome. Three years afterwards the patient, a negress of 36-40, was in perfect health, working daily, and enjoying the attentions of her husband as much as ever. The reporters attribute removal of alarming symptoms of septic poisoning to calomel in purgative doses, although using beef essence and stimulants.

A very extreme instance is reported by Dr. WEBB of a *thumb smashed off*, all but a strip of skin one-eighth of an inch wide, in which the soft parts united by first intention [printed *insertion*], while subsequently the bony fracture healed, and the member became as good as new. Perfect exclusion of air and water, with carbolic acid and glycerine over the bandages, are the means which proved so wonderfully efficient.

Cases of *malarial hæmaturia*, and of *malarial neuralgia* of stomach and bowels, as described by Dr. Galt in this Journal, April, 1872, are reported very intelligently by Dr. WEBB. One hundred and twenty grains of quinia, in three doses, within twenty-four hours, were given to a lad of fifteen attacked with hæmaturia. The drug had not been ordered in such large doses by the physician; but the patient was well on the third day.

Five cases of *puerperal convulsions*, successfully treated by *veratrum viride*, are reported. Doses seem rather alarming—twenty to thirty drops, soon repeated; while one gentleman recommends from thirty drops to a teaspoonful every fifteen or twenty minutes. The preparation used is not stated.

3. The annual address of the President of the *Colorado Territorial Medical Society*, without possessing anything specially original, is brief and sensible. The importance of gaining and diffusing accurate knowledge concerning the peculiar climatic features of the territory is earnestly urged upon the members. Investigation into the influence of the climate upon different forms of disease should be thorough and conscientious.

The President has full faith in the curative influence of Colorado climate in asthmatic cases. Hay asthma, too, he believes, is especially sure to be cured, or escaped, by a residence among the mountains.

In a report on surgery by Dr. H. K. STEELE, of Denver, the statement is made that during the late rebellion two surgeons in Georgia employed the "bloodless method" of operating, by first compressing the artery, and then tightly bandaging from the extremity upwards. Their names are given as Sanders and Hawthorn. A more notable illustration of the little real novelty to be met with under the sun is given in a letter dated March 19, 1823, in which a new method of lithotomy is proposed. The anus, says the writer, may easily be dilated sufficiently to receive the whole hand. This being done, with the rectum empty and the bladder filled with mucilaginous liquid, cut through the recto-vesical septum, and remove the stone with the fingers. The operation, we are told, gives little pain, and the wound will heal in forty-eight hours—a catheter being kept in place. It is a pity the writer leaves us in ignorance whether he ever really performed or witnessed this operation. The dilatation of the sphincter to this extent, for some purpose, has been very lately advised and practised as a novel procedure.

It is claimed in this surgical report that wounds heal with unusual rapidity and ease in Colorado. A larger number unite by first intention, fewer become gangrenous, and suppuration, when it occurs, is rapid and healthy. This claim, if substantiated, promises a brilliant future for Colorado surgery.

A report on *Materia Medica* would be more valuable if it treated of vegetable remedies peculiar to the locality, instead of drugs already known and studied.

We learn from another report that catarrhal troubles of the air-passages are rather frequent in this elevated region. Also, as might be expected, epistaxis, especially among persons newly arrived.

Original cases of operation for hare-lip are reported by W. R. WHITEHEAD, M.D. A curious case is described in which supposed fissure of the anus proved, after ether had been administered, to be only an impacted fragment of egg-shell. An attempt to establish a permanent supra-pubic opening into the bladder resulted fatally in fourteen days.

A brief paper by Dr. GEHRUNG points out the advantages of the climate for consumptives. Dryness, cool summer nights, the brilliant sunlight, the temptation to be much in the open air—resulting from the fine weather and the magnificent scenery—are some of these. It is clearly stated, however, that a tolerably vigorous digestive apparatus is essential to the recovery of the consumptive in Colorado. Without this the patient should stay at home. Some very sensible hints as to treatment are appended.

A case is reported by Dr. H. J. PRATT, in which ascites from "chronic Bright's disease" in a child of three years is stated to have been greatly relieved by the constant galvanic current, applied for ten minutes daily. Paracentesis had been performed several times—latterly at an interval of only three days—and the patient was failing. Under the use of a current from eight or twelve cells, directed from front to back, and from side to side, the child's strength improved, and tapping was deferred until three weeks had passed. Afterwards, galvanism being continued, the dropsy gradually lessened. At last the abdomen and limbs became nearly natural in size, though treatment was used only tri-weekly. Albumen and hyaline casts still appeared in the urine, though the child was active and playful.

A few other papers are included in this little volume which call for no notice. While some of its contents are not of especial value, we are glad to notice and heartily commend the entire absence of "fine writing." Noticing the expression of the publishing committee, implying selection of such papers as seemed most worthy, we thank them most heartily for their fearless honesty; for we are certain, from experience and observation, that they must have mortally offended many would-be contributors. We are sorry, however, to see that the proof-reading, if done at all, was not done by a physician.

B. L. R.

ART. XXIV.—*Reports of State Boards of Health.*

1. *Fifth Annual Report of the State Board of Health of Massachusetts.* 1874. 8vo. pp. 550. Boston, 1874.
2. *Second Biennial Report of the State Board of Health of California.* From 1871 to 1873. 8vo. pp. 235. Sacramento, 1873.
3. *First Annual Report of the State Board of Health of Michigan.* For 1873. 8vo. pp. 101. Lansing, 1874.

1. WE have formerly noticed at considerable length several preceding *Health Reports of Massachusetts*. If we deal more briefly with the one for 1873 it

will not be owing to any diminished value or interest. Were the mine less rich we could more readily display its treasures. The same great ability and sound judgment heretofore characterizing the work of the Board are still amply manifested. The student of social science and public hygiene will find nearly every essay, statement, and suggestion worthy of careful attention.

The President, Dr. BOWDITCH, contributes an essay entitled, *Preventive Medicine and the Physician of the Future*. Believing that it will more and more become the chief aim and function of the physician to avert disease, to remove or to hold in check its causes, the writer illustrates what he thinks should be, and in the future will be, the course of a medical man, by a hypothetical case. Assuming that a young couple, hereditarily inclined to phthisis, have a child born to them, he points out the entire conduct of life which the physician of the future will counsel the parents to enforce and the offspring to follow. Printed by itself, this little tract might serve an admirable purpose as a guide to parents all over the country in the rearing of children. Though especially suited to cases where phthisis is to be feared, the great majority of its suggestions are generally applicable and excellent.

A paper *On the Present Condition of Certain Rivers of Massachusetts* continues an investigation already reported upon at considerable length in a preceding volume. As an example of the accuracy and care with which all the work of this Board is performed, we notice that the analyses of the Merrimack water are from some fifty samples taken, at different seasons, at a dozen different localities, by Prof. NICHOLS with his own hand.

Attention is directed by the writer to the dangerous fallacy of assuming the wholesomeness of river-water whenever chemical tests reveal no noxious matter. Cholera excreta may effectually poison water even while wholly undiscoverable by analysis; and it is nearly certain that other injurious substances, in amount too small for detection, may yet cause disease.

The use of river-water for city supplies, and the comparative purity of different streams, are fully discussed.

We are pleased to observe Prof. Nichols's statement that most of the many hundred analyses required in this research were made by a woman, Miss E. H. Swallow. His expression of confidence in the accuracy of her work—being a man not given to extravagant utterances—is high praise, and leads us to inquire whether analytical chemistry may not afford a good and profitable field for female talent and industry.

The great *Brighton Abattoir* established through the efforts of the Board in a suburb of Boston, has proved a success, and is an achievement of which these intelligent and public-spirited men may well be proud. The strict cleanliness observed, and the use of all improvements and devices for preventing and consuming offensive products, have done all that was expected. The establishment is in no way obnoxious. The accommodations afforded are being constantly increased by the addition of new buildings. Our readers may remember that the Board has power to close private slaughter-houses, rendering-houses, etc., when, and only when, they are adjudged nuisances. As fast as increasing density of population leads to such results, the proprietors are encouraged to remove their business to the Brighton abattoir. In the first six months of its use, some 17,000 neat cattle and 150,000 sheep have been there slaughtered, and all products utilized. These numbers are estimated to be, respectively, about one-third and three-fourths of the total city supply. Additions already begun will double the facilities for neat cattle. Butchers, far from being as at first reluctant, are now eager to obtain admission to the abattoir.

An illustrated description of the buildings, and the rules which govern their use, add to the practical value of this paper.

One of the most interesting and valuable essays concerning sanitary matters that we have ever read is that prepared for this report by Dr. J. F. A. ADAMS, of Pittsfield. It is entitled, *The Health of the Farmers of Massachusetts*. It is in part founded on and made up of the answers received from physicians in the rural districts to a circular containing a score of questions relating to all influences and circumstances connected with the health of farmers and their families. It shows, however, on the part of the writer a thorough personal knowledge and much reflection, as to New England country life. The practical conclusion is, that though farmers are as long-lived as any other class, they are subjected to many preventible causes of disease. Bad cookery and deficiency of fresh meat; dampness of location, with ill-drained cellars, and bedrooms on the ground-floor; improper disposal of kitchen refuse, dirty water, and faecal matters, with frequent proximity of drinking well to sources of pollution—these are named as prominent causes of ill health. Want of recreation, too, is considered to have some effect. The writer also believes that the general use of feather beds in country families has a most pernicious influence. First, however, among all harmful circumstances, especially upon the farmers' wives, he places overwork and exposure. Too often a mistaken economy or a false pride, and a wish to be thought "smart," leads to the wife of the farmer performing the whole labour of her house, with part of that of the dairy and poultry-yard. In winter the bedrooms are usually wholly unwarmed, as indeed is every room except the kitchen and the sitting-room, which is tolerably sure to be suffocatingly close and hot from its air-tight stove. For the men, danger arises from the excessive exertions required or prompted by the pressure of work at certain seasons. Too little care is used to avoid getting chilled after being heated by exhausting labour. The influence upon offspring of the mother's continued hard work during pregnancy and lactation is also noticed.

Dr. J. BAXTER UPHAM contributes a paper containing the principal facts concerning the *Epidemic Prevalence of Cerebro-spinal Meningitis*. Over five hundred cases were reported to him. The mortality was about forty-four per cent. The number of males attacked slightly predominated. As to causation, Dr. Upham attaches chief importance to some occult atmospheric influence.

Dr. DERBY contributes a paper on *Hospitals*, which is both very sensible and very timely. Thoroughly recognizing the evils now laid to their charge, he declares that the time has come for a radical change in our modes of construction, whereby these evils shall be corrected, or at least reduced to their lowest possible degree. While for the most part concurring with him, there are a few points in regard to which, it appears to us, his views are scarcely supported by the results of observation or the testimony of men qualified to judge. The importance of the subject will warrant a brief examination of these points.

Dr. Derby declares emphatically that hospitals should be built one story high, and no more. Now, though quite as averse as he is to buildings of three stories, we are yet not quite sure that single storied structures are on the whole the best adapted to the purposes designed. The cost of construction is greater; and the expense of warming, as well as of ventilation, if an efficient system be adopted, is much larger. True, outlay must be disregarded if required for the best hygienic effects; but it does not appear that two stories are so clearly objectionable that we must insist upon a condition calculated to check the multiplication of hospitals. On the contrary, we are inclined to believe that

with two stories we avoid the objections lying against the single and against the three-story arrangement, while securing all the advantages of both.

In the matter of ventilation, Dr. Derby would find it hard to maintain his position in the face of what has been already accomplished. "All systems," he says, "of supplying the needed amounts of fresh air to hospitals of more than one story have failed. The most elaborate contrivances do not meet this fundamental want." We are not aware that many of our general hospitals have been provided with the most approved methods of ventilation. As to the ventilation of the City Hospital at Boston by one of these artificial contrivances, referred to by the writer as a "failure," we are surprised that any one should consider it as other than a most bungling device. It is a curious fact that in the ventilation of our general hospitals, and in those of England as well, we find less recognition of established scientific principles than we do in penitentiaries and insane asylums. More than thirty years ago there was introduced into the prison at Pentonville, near London, a plan for ventilating into a tall chimney, heated to create a current. The success of it was doubted by no one. In most of the hospitals for the insane in this country, the renewal of the air is promoted by some artificial aid, such as fans, or tall chimneys, or steam coils; and we have heard but one opinion respecting the result. There is indeed no mystery about the matter. The laws of pneumatics are as fixed and as well known as those of any other science. In the attempt practically to apply these laws, ignorant builders, it is true, often fail of success by neglect of some essential condition. In the hospital at Taunton, Mass., for instance, the foul air flues are all led into the boiler chimney, which was too short even to procure enough draft for the boilers alone. It certainly is not very complimentary to the mechanical ingenuity of our time, to suppose that we are incompetent to make any effective improvement upon the natural methods of ventilation. The experience already referred to, however, shows that the object has been most satisfactorily accomplished. Indeed, we are amply warranted in saying that any hospital unprovided with efficient artificial means for changing its air, is behind the age. We are consequently much surprised that, in Dr. Derby's single, brief paragraph, on the ventilation of hospitals, he alludes to artificial methods only to condemn them, and is contented to rely on the primitive agency of doors and windows. This is equivalent to a total abandonment of ventilation during weather cold enough to necessitate closure of these but not cold enough to demand fires. Upon this matter, in the construction of hospitals, too much stress can scarcely be laid, since it, more than anything else, will determine the measure of their success. Building committees are always but too ready to catch at any excuse for rejecting arrangements that add to the expense. Medical men, therefore, when consulted by them, should be very cautious how they undervalue alleged improvements in a matter of such importance as that of ventilation. Better service would be done by giving to the proposed methods an intelligent examination, ascertaining the conditions on which depend their effective action or their failure, and then insisting upon the adoption of that plan which promises the best results.

We wish that Dr. Derby had taken occasion to refer to tent hospitals. In reducing the mortality after operations, and in promoting the comfort and hastening the recovery of patients, their superiority to permanent buildings was clearly shown during our late civil war. Indeed we have yet to meet with the first physician who was in the service, who did not have the most favourable impressions concerning them. They were used to some extent last summer in connection with the City Hospital in Boston, greatly to the satisfaction, we

have understood, of the medical staff. In view of this and other recorded experience, we are warranted in saying that tent hospitals¹ constitute an invaluable improvement in our means of treating the sick and wounded during warm weather, and that therefore they should enter into the plans and arrangements of every general hospital hereafter built.

We have said that this paper is timely, because hospitals are now multiplying among us much faster than at any previous period. It will probably not be very long before every town of thirty or forty thousand inhabitants—at least in some parts of our country—will have its general hospital. It is therefore highly important that the public should be furnished with correct ideas respecting their construction. It is truly lamentable to see costly establishments recently erected, entirely destitute of improvements sanctioned by the highest authorities, and even violating in some of their arrangements the first principles of sanitary science.

The Political Economy of Health is the title of an article by Dr. EDWARD JARVIS. As might be expected from the ability and special experience of the writer, we find here a forcible exposition of the policy or economy—viewed from a purely financial stand-point—of all legislation leading to the preservation of life and health. The methods by which governments may labour for the attainment of this object are also clearly set forth. Dr. Jarvis's arguments to prove the true economy of prompt and proper care of the insane, and of all other measures which will diminish illness and prolong the capacity for work, must convince all but the extremely short-sighted.

School Hygiene is the subject of a paper by Dr. FREDERICK WINSOR. Collecting, after the method so largely used by this Board, views, facts, opinions, and answers to a series of interrogatories, from all parts of the State, the writer has produced a deeply interesting and most suggestive essay. There is unfortunately no room for doubt that our schools are not, from material, intellectual, or moral points of view, at all what they ought to be, in order to allow and promote healthful development of the bodies and minds of youth. The subject is far too wide for consideration here. We wish every teacher, every parent, every architect and builder of school-houses, and every committee-man—if by good luck the latter be intelligent enough to understand it—could read this excellent article.

For the assistance of towns about organizing local health-boards, and for newly appointed officers, Dr. AZEL AMES, Jr., gives a clear and practical account of the organization, regulations, and *Work of Local Boards of Health*.

The common and increasing use of *Zinc* or *Galvanized Iron* for the *Storage and Conveyance of Drinking Water*, led the Board to inquire whether any harmful results followed the use of water thus carried. Dr. BOARDMAN, after careful investigation, finds no reasonable ground to believe that the minute amounts of zinc taken up by the water are otherwise than perfectly harmless.

2. *The Second Report of the State Board of Health of California* can scarcely bear comparison with those of some older States. It requires almost a special education to make figures tell the truth; and it certainly requires a well disciplined mind to deduce and exhibit the lessons taught. The essays on various subjects are not distinguished by particular ability or merit. In the one or two papers to which we freely concede originality the novelty is not of a sort to be commended.

¹ In a notice of the *Life of Dr. John Warren*, in the last number of this Journal, we directed attention to successful use of tents and rude log huts for hospital purposes during our Revolution.

The Board sets forth the importance of popularizing sanitary knowledge, and recommends the endowment of a professorship in the State University, and a bureau in the general government for the diffusion of information concerning the public health.

It is claimed that San Francisco is the healthiest great city in the world, and that the State of California fully deserves its high repute as a healthful residence. Without disputing the truth of the conclusions, we yet believe that the materials for accurate inferences are not yet provided. As yet the statistics are not so full and accurate, nor the compilers so skilled and experienced in their difficult task, as to command entire confidence.

The volume includes reports of the condition and working of the various State charities.

A member of the Board submits a scheme for the creation of *probationary asylums* for the immediate reception of persons alleged to be insane. One of these he thinks should exist in each large city. The writer states, with much force and cogency, the causes which too often prevent early resort to the curative agencies of the State hospitals. The distance is frequently very great; the true character of the disease may be in some doubt; the friends may anticipate death or speedy recovery at home; but above all, and adding force to all other reasons, is the difficulty, expense, danger, and publicity which the law attaches to all commitments of the insane to the hospitals. Nominally designed to protect individual liberty, the legal provisions are admirably adopted to deprive of the advantages of early hospital treatment all patients not palpably maniacal. We would naturally suppose that one who appreciated the difficulties and evils as the writer appears to do, would recommend a radical modification of the existing law as to admission to insane hospitals. Instead, however, of such simple methods, we have this somewhat cumbersome device of probationary asylums,—half-way houses on the road to chronic lunacy. To these our author would make admission perfectly easy, apparently requiring no formalities whatever. Detention here can last, however, only ninety days. Here, if longer treatment is desired by friends or others, the ordinary legal examination must be made, and then the patient either released or transferred to a State hospital. The officers of such asylums are also to serve as experts at the call of the courts, and to hold for observation persons pleading insanity as excuse for crime.

The originator of this precious scheme thinks it will cure most genuine cases without further treatment. False imprisonment, too, is prevented: the three months, we suppose, do not count. In some mysterious manner, moreover, it is to save families from the stigma of hereditary insanity, since the probationers are not *declared* or *convicted* as insane.

That the annoying publicity and onerous expense necessitated by existing laws before an insane man can be treated, should suggest some method of evasion is a significant comment on their wisdom. The proposal before us, however, seems to us a mortifying example of ignorance. Very many recent cases might be convalescent after three months' judicious treatment, if knowledge of their probationary position did not prevent; few would be in a condition to be safely discharged; and none could be subjected to the excitement of a trial, hearing evidence of friends and physicians and inflammatory appeals of counsel, perhaps resulting in formal judicial decision of their insanity, with sentence to confinement, no longer probationary, in a distant hospital, without terrible risk of relapse, or aggravation of their malady, and lessened chances of recovery. To this proposition, therefore, we must emphatically express our dissent. Let a hospital be erected near every large city, if possible,

and do not keep patients out of it by absurd and outrageous laws forbidding friends to care for their own sick, but for humanity's sake let us be spared this probationary monstrosity.

A Report upon Insanity and its Jurisprudence, prepared at the request of the Board, contains much that is very objectionable, and calmly sweeps aside the well-settled teachings of all the men who have made these matters their life-long study. Partial insanity, we are told, is attended with disease of only one side of the brain. In "dementia or idiocy" (using the terms as synonymous), both sides are affected. Delirium is due to over-oxidation of ganglionic cells from excess of arterial blood. Acute mania is described as the condition in which inflammation of the brain follows "a previous deranged state of the mind." After much richness of this sort in the way of general instruction, the reader is supposed to be prepared to appreciate the writer's own cases of insanity. These, to the number of five, are therefore given. All recovered, and with such wonderful celerity as to fully warrant the triumphant demand of the author why hospital physicians do not go and do likewise, or, as he puts it, "come up to the present state of scientific knowledge." This so advanced treatment consisted in purgation, bleedings, mercurials, and vaginal injections.

Choice comments on the case of Mrs. Laura Fair, and a critical consideration as to the degree of censure due to a lover who kills a jilting sweetheart, illustrate the breadth and depth of our author's thought on the subject.

Several essays on practical subjects are appended to this volume, which, though not pretending to much originality or to great thoroughness of treatment, are yet adapted to the diffusion of useful information on sanitary matters. The mineral and thermal springs of the State, accidents and explosions in mines, animal food, adulterations, sewerage, and the hygiene of the teeth, are among the subjects thus presented. The laws of the State bearing on hygiene are also printed.

3. A considerable portion of the *First Annual Report of the State Board of Health of Michigan* is taken up with the details of organization and the means adopted to obtain in the future sanitary information from all parts of the State. Unlike the report just noticed, this one has several truly admirable essays on practical subjects. The paper on *illuminating oils* exposes the inadequacy of certain State laws, especially as recently modified in the interest of dealers in these deadly fluids. The insufficiency of the inspection as provided by law, and the practical non-conformity to legal provisions, the terribly dangerous character of many oils freely sold, and the unprincipled charlatanry exhibited in the vending of recipes to make them unexplosive, all are clearly shown and forcibly illustrated. Proper methods of determining the safety of these oils are carefully described.

Wall papers, tags, labels, and confectioners' wrappers, coloured with arsenical green pigments, have here, as in Massachusetts, been proved to produce poisonous effects.

A paper of some thirty pages upon the *Hygiene of School Buildings* is perhaps the most important here published. Warmth, ventilation, light, number of stories, and number of scholars to be received, are all very intelligently treated. Could the principles here laid down be carefully adhered to in American schools, we should confidently anticipate a marked improvement in the health of our young people.

The three papers referred to are by the Secretary, Prof. R. C. KEDZIE, M.D., of the State Agricultural College. We congratulate the State on the possession of so excellent an officer.

B. L. R.

ART. XXV.—*Third Annual Report of the Board of Health of the Health Department of the City of New York, April 11, 1872, to April 30, 1873.* 8vo. pp. 349. New York: D. Appleton & Co., 1873.

THE title of this report seems sufficiently complex to indicate wheels within wheels; and yet it but faintly foreshadows the complexity of the organization which has for its professed object the preservation and improvement of the health of our great metropolis.

The Board of Health is composed of four police commissioners, four health commissioners, the health officer of the port, the Mayor, the "President," and the "Secretary." The latter officer addresses his introductory note, presenting the report, to the Mayor. In addition to the Board, as above described, we find enumerated a score of "officers of the Board," all of whom are different persons from the Board itself. The chief of these officers, the City Sanitary Inspector and Sanitary Superintendent, resigned during the year, and was succeeded by one of his subordinates.

The general Report of twenty-two pages, also addressed to the Mayor, is signed by Dr. Stephen Smith, who is one of the health commissioners. Then follows an Appendix of over three hundred pages.

Dr. Smith states that the Board is now dissolved by a recent legislative act reorganizing the city government. Without doubting that the late organization has accomplished much good, we hope its successor will be enabled to do yet more. The difficulty has been to enforce the recommendations of the health officers. Causes of disease may be clearly pointed out, and shown to be removable; but comparatively little benefit results unless power exists to compel preventive action.

The year 1872 was characterized by a mortality in the city one-sixth larger than that of its predecessor. The terrible heat of the week ending July 6, and the epidemic prevalence of cerebro-spinal meningitis and variola, were the chief causes of this increase.

Efforts to prevent the throwing of ashes and garbage into the streets, and to secure the separate removal of these, have not proved successful. The courts did not support the attempts of the officers to secure convictions for the violation of city ordinances.

A good work has been continued in the draining of low districts at the upper part of the city. The Board have power to order such work to be done wherever they shall deem it necessary to the health of the neighbourhood.

The presence of slaughter-houses and rendering establishments continues to be a serious annoyance and injury in many regions.

Some relief from the disgusting and hurtful emanations from the contents of privies undergoing removal has this year been secured by enforcing an ordinance compelling the use of pumps with air-tight hose and close carts. The cold of winter, however, preventing this operation, led to such accumulation by spring as to demand the speediest possible removal. The air-tight apparatus available not being sufficient for the exigency, the Board were obliged to allow a temporary return to the old methods.

Some excellent rules for the purification of street cars seem to have proved practically inoperative. They prohibit cushions, straw, and carriage of dirty clothes or bedding elsewhere than on front platform. Such regulations should be made and enforced in all large cities.

Public urinals are a convenience which our people have been strangely and

culpably slow to demand from the authorities of all great cities. Much suffering and much disease have undoubtedly resulted from the lack of such facilities. Other large cities should at once follow the example of New York in their establishment.

Life-saving apparatus, accessible to the police, along the river fronts, for use when persons are in danger of drowning, is also an admirable institution which might well be copied.

In the report of the City Sanitary Inspector, which begins the Appendix, we find the old complaint as to the want of proper support by the courts. Offenders against the most important sanitary regulations are constantly allowed to escape the penalties properly due to their misdeeds.

In a score of brief reports from district inspectors we find many interesting facts and good suggestions concerning the sanitary conditions of their respective localities. The number of cellar tenements has been much diminished. Their complete abolition is recommended. Privies, especially in connection with tenement-houses, continue to be a source of anxiety to the inspectors. Very great improvement has been made, however, in many hundred cases, by the introduction of a ventilating pipe or shaft, usually of galvanized iron six or eight inches in diameter, extending from the vaults up to a point somewhat above the roof, and terminating in a turn-cap, to create a draft. Believing, as we do, that none of these caps can be serviceable in a calm, we should like to see more stress laid on the importance of placing these flues in or against the chimney-stack. It is encouraging to learn that landlords are beginning to introduce this improvement voluntarily, and that tenants give preference to houses thus provided. One inspector believes ordinary privies, thus ventilated, superior in practice to water-closets with sewer connections. However great may be the theoretical advantages of the latter, they are nullified by the tendency to become obstructed through improper use and insufficient flushing.

The difficulties in the way of prompt and cleanly removal of ashes and garbage are spoken of by all as one of the grand obstacles to general neatness and purity. Another obstacle, consisting in the terrible filth of the streets, has been appreciably lessened of late since street cleaning has been done by the police department.

From one district, formerly very damp, comes striking testimony to the benefit resulting from the thorough under-drainage ordered by the Board. Where scarcely a family formerly escaped malarial disease, and often four or five members of one household were ill together, now a case is rarely heard of.

The improper construction and the over-crowding of the public schools is a subject of serious complaint.

The chemist of the Board makes a valuable suggestion as to the use, as disinfectants, of certain waste products, from various manufactories, and from the galvanic batteries of the police and fire telegraphs.

From the Bureau of Records again proceed bitter complaints against clergymen for their culpable neglect to make returns of marriages. While births annually recorded have increased in five years from 13,947 to 22,068, the marriages have changed only from 8,695 to 8,954!

The mortality for the year 1872 was, as we before stated, high throughout. In addition to the special causes mentioned there seems to have been an unusually fatal prevalence of the ordinary diseases of the seasons. The most striking fact, however, is the terrible mortality of the "hot week." The deaths on the seven days ending July 6, numbered 1591, against 807 of the previous week. Of the former, 733 were infants under a year old. Some two hundred other deaths could be attributed only to the extreme heat. A chart

is presented to exhibit the relations of these last to the mean temperature, highest in sun and highest in shade, mean barometer, and mean humidity, for each day of this remarkable period. Much moisture in the air seems to have increased decidedly the fatal influence of solar heat.

The mortality tables for the year are extremely minute and elaborate. By two magnificent coloured charts, there are shown for every day in the year the relations of the total number of deaths, and of the numbers caused by phthisical, by zymotic, and by diarrhoeal affections, to daily mean temperature and daily range, to weekly mean of barometer, to daily humidity, and to daily rain-fall.

The death-rate for 1872, estimating the population at one million, is 32.6 per thousand inhabitants. As compared to figures as given by cities here and abroad, this is high for a place in the northern temperate zone. But the innumerable sources of error deprive these comparisons of much value except in the individual cases where we know the data to be trustworthy. Providence, R. I., has for years possessed an admirable registration; and her death-rate is only 22.1. There, however, the topography of the place prevents the necessary crowding of the population which occurs in New York and in Boston, where the rate is 30.5. We doubt the correctness of the rates assigned to St. Louis, 20.1; and to Cincinnati, 20.5; and to Buffalo, 17.3. If these and similar figures from many cities can be shown to be nearly correct, their sanitary measures should be carefully copied.

Tables exhibiting mortality from special diseases in different wards and public institutions; from intemperance in different races, ages, and in different manners; from cancerous affections, according to sex, age, race, and organ; from phthisis, under like variety of conditions—these and several others present the grim facts under many aspects.

Tables exhibiting facts concerning marriages and births require no comment beyond that already made.

An investigation into the recent wide-spread disease among horses was made by order of this Board. The result is here given in a long paper embodying a *resumé* of facts as to former epizootics; the history of the appearance and spread of the one recently among us; statistics of mortality in the New York stables; description of the disease as there observed; results of examination of blood, urine, mucus, and other fluids, and of *post-mortem* appearances. The paper is illustrated by six handsome coloured lithographs of morbid appearances.

The writer regards the disease as the exact counterpart to epidemic influenza. While admitting that the simultaneous seizure of horses all over the city did not arise from contagion, the writer yet maintains that it spread from city to city, and State to State, solely and uniformly through the transportation of the poison by a diseased subject. Thus it would seem that he believes some occult atmospheric condition to be necessary to the prevalence of the disease, yet not of itself able to originate it; for he says that strict quarantine inevitably protects. In other words, contagion is necessary, while yet in a given city or stable the spread of the disease confessedly outruns the possibility of contagion.

Some inquiries as to adulterations have been made during this year. Previous examinations having shown lump and brown sugars to be pure, the observations were now extended to powdered white sugars. Over a hundred samples were examined without discovering any other contamination than dirt from exposure to air and dust. "Salæratum," so called, is now as often the bicarbonate of soda as it is of potash; and the former salt is not chemically

pure. Practically, however, very little adulteration was detected. Out of 28 samples, one was mixed with flour and another with *terra alba*, or sulphate of lime. Cream-tartar, however, was uniformly adulterated with the white earth, to the extent generally of more than 50 per cent., and in one case to that of 86 per cent. ! Baking powders, of mixed salts, were found to be effective and properly made. These are believed to be safer for the consumer than the extemporaneous mixture of the salts as usually obtainable.

In confectionery, the examiner believes arsenical green colourings to be obsolete. Yellows, and orange tints, however, are often due to lead salts. Gypsum is much used to obtain bulk and weight cheaply, and is a reprehensible and injurious ingredient.

Some very interesting observations on the quality of the air in public buildings, schools, prisons, factories, etc., are absolutely startling in their revelations of the prevailing ignorance and inappreciation of the whole subject of ventilation. Some good suggestions are here offered upon the need and means of providing school-houses with fresh and warm air.

An inspector charged with the examination of inhabited cellars reports them as peculiarly bad, and strongly recommends that they be no longer tolerated at all.

Respecting influence of trades and handicrafts upon health, nothing new is elicited, unless it be some facts indicating that young girls working in tobacco factories are retarded in their development.

A special report on school buildings is very sad reading. Taken in connection with the experiments on air in public buildings, it reveals a terrible source of debility, arrested development, disease, and suffering. Of schools, the writer says "not one has proper and adequate means for thorough and perfect ventilation." One basement room, without cellar, has one hundred pupils, with only one window, looking on a three story building eight feet distant. So crowded are the rooms as to furnish only from sixty down to forty cubic feet of space to each pupil. This, we need not remark, is shamefully inadequate. From 600 to 1200 cubic feet per patient, with frequent renewal, is the air space usually considered essential in hospitals. The amount of perfectly fresh air which ought to be supplied to each pair of human lungs is variously estimated at from $2\frac{1}{2}$ up to 20 cubic feet *per minute*. Fancy then the condition and the prospects of these wretched children, breathing their pitiful two cubic yards of tainted atmosphere over and over again, say some two or three thousand times ! Flues, built in the side walls are, as the writer correctly states, utterly useless, unless some efficient means of creating a draft in them is devised and kept in operation. The recommendations of the writer, though tending towards improvement, are yet very inadequate.

As if the carbonic acid, and the animal exhalations, from the lungs and bodies of the pupils were not bad enough, we are told that privies and urinals are of the worst construction and of improper location. The walls and ceilings, also, are generally filthy.

As another sad instance of the public ignorance and neglect of the laws of health regarding the air we breathe, we have a brief but most suggestive report upon the city prison known as "The Tombs." Four prisoners occupy each cell of 726 cubic feet, intended for one. The system of ventilation, as explained, and illustrated by diagrams, is a perfect example of "how not to do it." The warming is inadequate, and at expense of purity of air. The walls are damp, giving the cells an atmosphere of a vault-like and musty smell. The pipes carrying away excrement from each cell are untrapped, and open into a gently sloping soil-pipe which runs around each tier of cells. All open into

a single discharge-pipe leading to the sewer. There are no traps, in the whole system. Gases from the sewers pass freely into the cells. Malicious or accidental obstructions, originating from one cell, occasion overflow of filth in the cells behind it, and require considerable time and labour for their discovery and removal.

A very carefully written paper by R. W. Taylor, M.D., considers the question whether syphilitic infection has been or may be propagated by the Jewish rite of circumcision. The conclusion is that, in the cases reported, some were not syphilitic, and another was otherwise caused. The possibility of communicating infection by the operation is acknowledged. Certain parts of the procedure, as sometimes conducted, are recommended to be modified.

In closing our notice of this valuable publication, we would suggest that a good, analytical table of contents, in addition to the index, would add much to the usefulness of the work. As it is, we are obliged to turn over all the pages to discover the subjects treated. The volume is well printed, well bound, and apparently carefully compiled. The charts, which in this as in the preceding number are a prominent feature, are admirably executed. B. L. R.

ART. XXVI.—*The Toner Lectures, instituted to Encourage the Discovery of New Truths for the Advancement of Medicine.* Lecture I.—*On the Structure of Cancerous Tumours, and the Mode in which Adjacent Parts are Invaded.* By J. J. WOODWARD, Assistant Surgeon U. S. A. Delivered March 28, 1873. Washington: Smithsonian Institution. November, 1873.

THE "Toner Lectures," we learn, have been established by that public-spirited physician, Dr. John M. Toner, of Washington, D. C., who has placed in the hands of a Board of Trustees a fund "the interest of which is to be applied for at least two annual memoirs or essays relative to some branch of medical science, and containing some new truth fully established by experiment or observation."

The first of these admirably designed lectures was delivered March 28, 1873, by the well-known microscopist, Dr. J. J. Woodward, U. S. Army, on the Physiological Anatomy of Cancer, and has been published by the Smithsonian Institution in pamphlet form. The subject has been well chosen, for, apart from purely scientific interest, the vast clinical importance of cancerous growths cries aloud to the profession to search, by every means, for accurate knowledge concerning their nature and mode of development, in the hope that something useful for the sufferer and the surgeon to know may yet come out of the labours of the histologist.

The lecture opens with an historical *résumé* of the different opinions advanced by the more prominent original investigators on the subject of the histogenesis of cancerous tumours. Thus we have, first, the idea of free cell-formation advanced by the early followers of Schwann, and upheld by Rokittansky. This now exploded theory was swept away chiefly through the labours of Virchow, who, secure in the general principle of "*omnis cellula e cellula*," ascribed the immediate parentage of the epithelioid elements of cancer to the normal connective-tissue corpuscles of the affected part, and logically contended for the purely local origin and nature of a primary tumour, whether cancerous or otherwise. Next follow the far-reaching discoveries of

Von Recklinghausen and Cohnheim concerning the free migration of leucocytes, and the important rôle they play in new tissue-productions—discoveries which necessarily invalidate Virchow's notion concerning the strictly family relation, so to speak, of all new cell-forms to the original cellular elements of the affected territory. The whole subject of the histogenesis of morbid growths becomes thus opened anew; and next we have Thiersch, in 1865, claiming that epithelial cancers, at least, are derived purely from cell-multiplication of ordinary epithelium—a doctrine which Waldeyer, in 1867, extended to all cancers, finding the epithelial parents of the cells of deep-seated carcinomata in the normal gland-cells. In 1869 Köster observed that the cylindrical cell-masses of cancers anastomose freely, and in many places, at least, are covered by the peculiar endothelium of the lymph-channels, whence he inferred that the latter elements are the parents of the morbid growth. Next Classen, in 1870, boldly struck out and advanced the idea that migrated white blood-corpuscles alone are responsible for the cancerous cell-foundlings, and Dr. Woodward tells us that his own partial advocacy of the same view two years later was based upon original observations, and was made without knowledge of Classen's paper. In 1872, again, Waldeyer reviewed the whole subject, and while admitting Köster's observation of the fact that the cancer-cylinders lie in the lymph-channels, and that the small-celled infiltration of the tissues invaded by cancer is due to accumulation of migrating leucocytes, yet adhered to his original doctrine of the strictly epithelial parentage of the cancer cell-elements proper.

Such being the conflicting opinions of modern histologists, Dr. Woodward cites the fact that Billroth advocates the views of Waldeyer, and of Rindfleisch he says:—

“Rindfleisch entertains opinions more nearly allied to those of Classen. Rindfleisch admits that, perhaps, in cancers involving glands, the glandular epithelium may undergo fissiparous multiplication, and so contribute somewhat—though only, as he thinks, to a moderate extent—to the formation of the cancer-cylinders. But he thinks that a far larger part is played by migrated white blood-corpuscles, which, instead of being transformed into pus or connective-tissue, as in inflammation, accumulate in the lymphatic passages, and are metamorphosed into epithelium-like elements.”

This, however, is hardly a correct statement of Rindfleisch's views, as expressed in his *Text-book of Pathological Histology*, quoted by Dr. Woodward. This author, it must be remembered, considers that there are two modes of normal growth of epithelium—one “primary,” whereby the youngest and innermost cells of an epithelial layer are derived from epithelioid transformation of wandering formative cells from the underlying connective tissue, under the influence of actual contact of such cells with the epithelium-tissue itself; the other “secondary,” being simply multiplication by division of the pre-existing epithelial cells. Now, all cancers are, for Rindfleisch, “abnormal effects of epithelial growth,” and as such he defines and classifies them. Dividing them generally into glandular and epithelial cancers, he says of the whole group of the former, “that the new formation proceeds from the glandular epithelium, has of late been established by numerous investigations. The cells multiply by division.” (*Pathological Histology*, American edition, p. 181.) Taking up, then, the varieties of glandular carcinomata, he distinctly affirms of the cells of soft cancer that “they prove themselves as the genuine offspring of the intestinal glandular plate.” (*l. c.*, p. 161.) In treating of the “telangiectatic” and “sarcomatous” forms he makes no special mention of the mode of origin of their cells, and only in connection with hard cancers and epitheliomata

does he seem to consider that his "primary" mode of epithelial growth by epithelioid transformation of formative cells is largely concerned in the begetting of the cancer-elements. And even here, it must be borne in mind, such cell-genesis is simply a *mode of growth of epithelium*, since Rindfleisch carefully points out that such epithelioid transformation of formative cells from the connective tissue layer can only take place by contact with pre-existing true epithelium. And even in hard cancer he distinctly says that "the *active* behaviour of the glandular epithelium . . . is and remains the peculiar source of morbid action." (*l. c.*, p. 167.) For Rindfleisch thus, as for Waldeyer, all cancers are of epithelial nature and origin, and grow after the manner of ordinary epithelial tissue, only Rindfleisch admits an epithelioid transformation of leucocytes as one factor in such normal growth. Classen, on the contrary, if we understand him aright, cuts loose entirely from the idea of cancer being *necessarily* of epithelial origin, and recognizes an independent cancerous transformation of leucocytes, whose cell-type will be epithelial if the site of the original morbid action happen to be in contiguity with normal epithelial tissue, or of the character of connective tissue, if the same site be in a tissue derived from the middle germinal layer. While, therefore, both Rindfleisch and Classen recognize the bald fact of the direct transformation of a leucocyte into a cancer-cell, their ideas of its signification, and of the general physiology of the morbid growth, are essentially different.

Dr. Woodward next proceeds to the original part of the lecture, which consists of a detailed description of the anatomy of cancer, illustrated by photomicrographs from sections of tumours, exhibited by means of a stereopticon. Searching through these anatomical details for Dr. Woodward's position on the vexed question of the histogenesis of the cancer-cells, we find that, following Rindfleisch, he admits, as a matter of fact, both epithelial cell-multiplication and direct transformation of leucocytes into cancer-elements; but there he stops, declining to uphold or advance any hypothesis of the general scheme of cancer-development as a pathological process. We fully commend his caution, but at the same time we utterly fail to see how this lecture, instructive though it be to those unfamiliar with the present state of knowledge on the subject, fulfils the high requirement of the "Toner Lecture" prospectus, of "containing some *new truth fully established by experiment or observation.*"

E. C.

ART. XXVII.—*On the Government of the Retreat for the Insane, at Hartford, Connecticut.* Printed for private use. Hartford, Connecticut, 1874.

WE once thought that the question agitated in this pamphlet had been set at rest by the results of an abundant experience, both here and abroad. It seems to be a characteristic of our times to consider nothing as settled, and to reopen old controversies, though without the aid of additional knowledge. It is a cheap way of distinction, attractive to a certain class of minds, to revive an obsolete doctrine or practice, and invest the arguments in its favour with an air of novelty, while completely ignoring those which sealed its fate with a former generation. This is easily done, and makes the desired impression on those whose vanity is flattered by the idea that differing from the simple souls who cling to an established belief is a proof of superior wisdom. It would seem as if half the intellectual labour in the world was used in combating errors

supposed to have been killed, but rising up from time to time, refusing to stay killed.

The question with which this pamphlet is concerned is closely connected with the proper working of a very interesting class of our institutions—the hospitals for the insane. It is a fact, though its significance is but dimly seen by the outside world, that their success depends very much on the manner in which their service is organized. A hospital should be like a piece of machinery, in which every part holds certain relations to every other part, and all act harmoniously in the production of a special end. Unlike a machine, however, the forces required in the management of a hospital can be kept in their proper relations and adjusted as occasions require, only by a controlling force paramount to every other. The thing to be wrought out is definite and simple, and every movement, many and diverse as they are, all tend to its accomplishment. This being so, it is obvious that the whole establishment should be guided and controlled by a single spirit, competent to the work and responsible for the result. If the superintendent is just what he should be, the impress of his character should be seen in every direction, in every architectural arrangement, in every contrivance for occupying the attention of his patients, in every appliance for maintaining their physical powers in the best hygienic condition, and in the ways and manners of every one engaged in the service. Nothing can be more preposterous than the idea that any of the agencies employed in effecting the purposes of a hospital can be well managed by joint but independent powers. Any attempt of this kind must inevitably be followed by collisions and an imperfect result. These views are strongly confirmed by the testimony of many present and past superintendents in letters addressed to Dr. Denny in reference to the position he has taken.

The idea that more than one independent power should be employed in the executive duties of hospitals for the insane, must have arisen from the crudest conceptions of the nature of the work allotted to them, and a glance at their history abundantly shows that such is the fact. Not many years ago insanity, considered as an object of medical treatment, was regarded almost exclusively in its physical aspects, and in the little account that was made of the mental affection, the idea of depravity and unlicensed passion was more prominent than that of disease. From such views sprang the arrangements usually adopted in early times for the management of a hospital for the insane. The executive officer whose authority was paramount in the house was the steward or warden, who organized and directed the service, who ordered whatever was done or not done for the patients, excepting in the matter of drugs, and who ruled over all, sane and insane, with an autocratic hand. He might, or as is most likely, he might not, have had any knowledge of the nature or manifestations of insanity. Nor did he much need it, for the whole moral treatment, all of which was entrusted to him, consisted chiefly in imposing such restraint or punishment as the case might seem to require, while the medical treatment was prescribed by some physician of the neighbourhood, who visited the house two or three times a week and ordered the sort of medication that happened to be in vogue, such as bleeding, purgation, cold applications to the head, and shaving of the scalp, in the recent cases, with systematic purgation all around in the spring. Under such management the most frightful abuses were unavoidable. To the rude and ignorant master of the house the stormy manifestations of disease seemed to be only outbreaks of bad temper and angry passion, to be met by straight waistcoats, shower-baths, low diet, and the fiercest threats, if not blows. Luckily, the source of these evils came to be recognized at last, and the proper remedy found by a change in the organization of the service,

whereby the hospital was placed in charge of a medical man qualified by a suitable training and high professional aims, who governed the whole. He resided in the house, appointed the attendants, prescribed their duties, was conversant with all the details of the service, exacted implicit obedience to his authority, and in every arrangement had reference to the accomplishment, in the completest manner, of the special ends of the institution. Not that this change occurred at once, *per saltum*, as it were, for in most cases there was a transition period, when the steward continued to be independent in some particulars, and the managers or guardians occasionally took a turn at the executive wheel, as they do to this day at the Blockley, in Philadelphia, and at Blackwell's Island, in New York, where, for instance, they appoint and discharge attendants when some needy protégé is to be provided for. Our hospitals having come into existence towards the close of this period were, with a few exceptions, organized after the improved methods. Among the few in which some features of the old system were retained was the "Retreat," a corporate institution at Hartford, Connecticut; and though they have ever been a source of trouble and bad feelings, yet the board of managers has never been willing to recognize the entire and exclusive control of the superintendent. A year or two ago, Dr. Butler, after thirty years of faithful service, resigned, and Dr. Denny, eminently fitted by character and training for the work before him, was appointed his successor. In order to prevent a renewal of the old grievances, this gentleman endeavored to obtain from the Board of Managers such an alteration or construction of the by-laws as would give him a control paramount to and independent of every other. Failing to obtain it, he promptly resigned his charge.

The pamphlet before us is occupied chiefly with correspondence between Dr. Denny and the Board of Managers, and letters from many eminent superintendents, thoroughly sustaining him in the position he had assumed. It constitutes a valuable contribution to the cause of hospital improvement, and we hope its lessons will be carefully pondered by all who are connected with the direction of these institutions.

We do not suppose that the stand taken by Dr. Denny will be universally approved of. Some will contend that for all practical purposes he was thoroughly independent, and that it was a matter of caprice or fastidiousness to seek for control beyond his special sphere. Others, with little regard for the merits of the question, are constitutionally opposed to any one-man power, and they, of course, will not be likely to uphold him. With these it would be useless to argue, but to the former we take the opportunity to present some considerations that may have escaped their notice, for the functions of the superintendent are so peculiar that their whole breadth and scope are not readily perceived by the ordinary observer.

In the little world of which he is the head no person or thing is foreign to the single and special purpose which it is his business to accomplish—the restoration of the disordered mind. Not the cook in the kitchen, nor the farmer on the grounds, nor the mechanic in the shops, nor the engineer in charge of the boilers, should work independently of his oversight and control. And yet if the views of the Hartford managers are correct—if any of the employés could be properly placed beyond his immediate control—it might certainly be supposed to be these. But let us look a little more closely at the parts these persons have to perform in the daily economy of a hospital. No one will deny that the efficiency of a hospital depends very much on a well-ordered kitchen. Not only the present comfort and satisfaction of the patient, but his final restoration, are involved in a supply of food intelligently cooked, skilfully varied,

promptly and properly served. Work on the farm or in the shops, judiciously managed, is a restorative agency of incalculable value. The proper distribution of air and heat is scarcely surpassed by anything else, as everybody knows, in its hygienic influence. And yet in a hospital governed like the "Retreat" the Superintendent's wishes in regard to these things may be imperfectly met, if not completely frustrated, simply because the persons concerned in them are not responsible to him. If he enters the kitchen it is only on sufferance, and if his directions are followed it is only as a matter of favour, not of right. If he finds his patients when out at work are badly treated or neglected by the farm hands, his complaints may be treated as unreasonable or whimsical, and no amendment follows. If the duty of warming or ventilating the house is badly done, he may be powerless to make it any better. And the reason for all this is obvious enough. The Superintendent fails to obtain the best performance of duties of the highest importance to his success, because the persons employed for the purpose are accountable to somebody else. They look for control and direction to one who alone has the power to enforce his wishes by the strongest of arguments—summary discharge. Very likely, flagrant offences, highly improper behaviour, would be suitably noticed when reported, but this implies that the Superintendent must appeal to another for the redress of an evil which is frustrating the very object which it is his special business to accomplish. All this tends to lower him in the estimation of those around him; and by impairing the prestige of his office, his power for good is materially diminished. For let it be understood that he rules his little world with a divided empire; that in certain quarters there is a power fully equal to his own; that his word is not law in every part of it, and from that moment all true discipline departs, confidence is impaired, and his hands are crippled.

There is another aspect of the question which furnishes a conclusive argument in favour of these views. The material interests of a hospital require that there should be but one head, ordering its affairs by an intelligent appreciation of its resources and their judicious application to the various means that are employed to promote its purposes. How can such a result be expected when two heads are using those resources with little if any reference to each other? How can one appropriate money for a piece of furniture, or a carriage, or an aquarium, for the gratification of his patients, while, for anything he may know, every available means may be required by the other to pay for fancy stock, or new agricultural implements, or repairs on the kitchen? It is for the Superintendent to decide, and for him alone, between conflicting wants, and to say which shall be met at once and which postponed. Even in regard to the work on the farm, which may seem at first sight quite remote from his special sphere of duty, his supreme control may be required to direct it in the manner best calculated to promote the good of the patients. He wishes, for instance, the amplest supply of fruits, flowers, and all the delights of the garden. The steward believes that such things do not pay, and lays out for crops of mangolds and potatoes, hay and fodder. The one believes the farm should furnish an abundant supply of milk as a thing eminently conducive to economy and good health. The other prefers to turn his crops into some other shape. We might multiply these illustrations of the necessity of a supreme undivided control on the part of the Superintendent, responsible of course to the Managers; but if these are not sufficient to convince every fair-minded man, it would be useless to mention any more, and here we leave the subject, relying on the good sense of our readers to lead them to a just conclusion.

We cannot forego the opportunity to render to Dr. Denny our thanks for this noble vindication of the right and true; and in saying this we express, we

doubt not, the sentiment of the profession at large. Such devotion to a principle, involving as it did the sacrifice of a valuable appointment, will be held in grateful remembrance as long as any respect shall remain for elevated aims, an honourable ambition, and a triumph over mean and mercenary considerations.

I. R.

ART. XXVIII.—*Lectures on the Diseases of Infancy and Childhood.* By CHARLES WEST, M.D., F.R.C.P., Physician to the Hospital for Sick Children. Fifth American from the Sixth revised and enlarged English edition. 8vo. pp. 678. Philadelphia: Henry C. Lea, 1874.

THIS book represents the experience of one who has been peculiarly fortunate in having an extensive hospital and private practice in children's diseases, extending through more than a quarter of a century, and whose clinical deductions are confirmed by the records of nearly 2000 cases and 600 post-mortem examinations. Knowing this, it is with increased interest that we turn to a new edition of it to learn what influence changes in medical opinion have exerted upon the author's practice.

Although we find Dr. West is unwilling to believe that all his former observations were erroneous, and that his old faith was entirely misplaced, yet he frankly acknowledges that his practice now differs much from what it was a quarter of a century ago; that he depletes less, that he has less faith in mercury, that he employs antimony more rarely, that he has more confidence in Nature's powers, less reliance on his own resources. Yet he still believes that mercury possesses a peculiar and *specific* power in controlling acute inflammation of the serous membranes of the chest and abdomen; and that both acute pleurisy and acute peritonitis yield to a combination of calomel and opium more speedily than to opium alone. He believes that in severe inflammation of the mucous membrane of the large intestine—in other words, in dysentery in childhood—the part borne by mercury in its cure is at least of as much moment as that of opium, with which it is right to combine it; but the latter alone will fail when the two together will save the patient.

In laryngeal inflammation, or true croup, after the first active symptoms have subsided, Dr. West holds that mercury often plays an important part in its more chronic stages; and he still holds to the belief that in some forms of chronic non-tuberculous consolidation of the lung, recovery is expedited by the careful employment of mercurials. He does not regard mercury as of any service in acute affections of the pulmonary tissue, nor in any form of bronchitis, but still regards it as of service in acute pericarditis.

These are not the views usually taught at the present day, indeed quite the contrary are promulgated by the most recent American authors (Austin Flint, J. F. Meigs, and J. Lewis Smith), but coming from such high authority, and as the result of an extensive clinical experience, they certainly claim from us a careful and unbiassed test at the bedside.

This book contains such rich stores of clinical experience that we find ourselves well repaid in looking over its pages, particularly those concerning the treatment of diseases. In discussing the treatment of the formidable head symptoms which usher in the eruptive fevers, the author says:—

"I have of late years tried the use of the wet sheet in these cases, and with results all the more satisfactory, since they are obtained without any of that depression of the vital powers inseparable from the free abstraction of blood.

I have seen the packing in the wet sheet followed, in the course of one or two hours, by an abatement of temperature, a cessation of convulsions, and a return of consciousness, as remarkable as I have ever observed follow from even a copious bleeding, while the action of the skin has certainly been more speedily established, and the appearance of the eruption has been brought about sooner and more satisfactorily than by any other means with which I am acquainted. While, therefore, I would not say that depletion ought never to be practised, and while, if hydropathy failed, I should still have recourse to it, I no longer employ, nor should I advise that free depletion to which, in ignorance of these other means, I was accustomed to have recourse."

In cases of general febrile disturbance accompanied with excitement of the brain from whatever cause, Dr. West has seen much good result from the administration of small doses of aconite—half a minim every four hours to an infant of a year old. Hydrate of chloral is another remedy which he finds in these cases usually to act as a sedative, better even than any preparation of opium, obtaining sleep especially in those cases where wakefulness is due to restlessness, rather than to pain.

Bromide of potassium and hydrate of chloral our author esteems of great value; either alone or in combination they seem to exercise special influence in producing sleep in various disorders of the nervous system, such as spasm of the glottis in infancy, or chorea in subsequent childhood, and he finds them both free from the special risks of opium.

"They are of equal service in overcoming the persistent sleeplessness for which in delicate children it sometimes happens that no definite cause can be discovered. In cases where cerebral disease is suspected they may be given with advantage, and without obscuring the symptoms, and also in the restlessness of fever, provided the stimulating power of opium is not indicated. They do not, however, annul pain as opium does, even though they may produce sleep; the sleep is not refreshing if the actual suffering is severe when the patient awakes; and as they both tend to depress the circulation, they must not be given in cases of great exhaustion, nor, I think, when there is serious organic disease of the heart."

Dr. West also speaks of "the marvellous power in controlling convulsions" which these two drugs, either alone or combined, possess; particularly has this been observed in cases where there was no ground for suspecting organic disease, and where there were no distinct indications for treatment beyond such as were furnished by the frequent recurrence of the convulsions.

"Of the two remedies, the bromide has appeared to me the more reliable; but in order to obtain decided results from it, it needs to be given in doses larger than those which are commonly employed; as, for instance, from two to three grains every four hours for a child of one year old, and from three to five grains from the age of three to five. It does not give earnest of good within the first thirty-six hours, there is little use in continuing it, though it may still be persevered with, with the addition of one or two grains of hydrate of chloral. The depressing effects of the bromide must not be lost sight of; and either their occurrence, or the failure of the remedy, may compel us to use chloral in similar doses, though at an interval of every six or eight, instead of every four hours. I think, however, that on the whole I have obtained the best results from the bromide every four or six hours, accompanied with a single full dose of chloral every night at bedtime."

Dr. West's testimony to the value of bromide of potassium in the treatment of epilepsy is very opportune, and we are inclined to believe that it coincides with the experience of many on this side of the Atlantic. He finds that it seldom fails within the first few days of its administration to arrest the frequency of the attacks, and now and then it has seemed entirely to prevent them; this latter result, however, he has observed more frequently in cases of persist-

ent, frequently repeated infantile convulsions than in the distinct epilepsy of childhood, though even here he has had some few apparent successes. In the great majority of cases the amendment, though very marked at first, has not entirely maintained itself; the system has after a time become habituated to the remedy, and after several augmentations of the dose, each of which has seemed to renew the old influence, he has been compelled to discontinue it in consequence of the depression of the pulse, the general loss of power, and the appearance of the peculiar pustular eruption which occasionally follows its long-continued use. In other cases the agent which at first worked wonders ceased to have any influence; the constitution tolerated the increased dose, but so did the disease; the patient continued to take the medicine, but the fits, though once controlled, returned after a time just as before.

Still, with all these drawbacks, the bromide remains the only agent which in Dr. West's hands has made the least approach to the character of a specific in the treatment of epilepsy.

"I always employ it when I can find no distinct indication to guide me. I confess that I use it empirically, for I have found no means by which to distinguish beforehand the cases where the bromide will do permanent good from the other apparently similar but much more common instances in which its influence is merely temporary."

In the chapter on chorea Dr. West rejects, for certainly sufficient reasons, the theory of embolism as the cause in all, or even a majority, of the cases of the affection, and he still places it in the same category with the majority of the convulsive affections of early life, believing that its phenomena depend on irritation, direct or indirect, of the nervous system.

The only remedy which has appeared to him to exert any specific power over the disease is the sulphate of zinc, beginning with half a grain three times a day, and increasing the dose by a grain daily, until the dose is arrived at which appears to fairly control the movements. And it is not unusual to find a remarkable tolerance of the remedy established, and as much as 10, 15, or 20 grains taken three or four times a day with perfect impunity. Dr. West has never increased the dose beyond the last amount, thinking that if three weeks' trial, at the end of which so large a dose was arrived at, produced no result, the remedy might be considered to have failed.

Since the publication of the preceding edition Dr. West has become an ardent advocate of the operation of paracentesis of the chest in cases of pleurisy, and knows of no valid arguments against it. In no single instance has he ever regretted its performance, but has often been sorry that he did not have recourse to it sooner. He thinks it should be resorted to in every case of urgent dyspnoea, accompanied with effusion into the chest, where there is reason for believing that great, even though only temporary, relief would be obtained by the evacuation of the fluid; in any case of acute pleurisy in which, however early it may be in the disease, there is fluid in quantity sufficient to modify the form of the chest or to produce displacement of the viscera, the child at the same time suffering from cough, distress, or dyspnoea. The chest ought also to be tapped even independent of those symptoms of constitutional disturbance, if the effused fluid should remain stationary for three or four days in spite of treatment; and he believes that, even though nature might eventually have accomplished the absorption of the fluid without this intervention, recovery will take place more speedily as well as more surely in consequence of the tapping.

In cases of doubt, Dr. West recommends that the diagnosis be verified by puncture of the chest with a hypodermic syringe, and in case of tapping, the trocar to be introduced in the fourth or fifth interspace, and about two inches

outside the nipple, unless there should be some special reason for choosing some other position.

The general rules given for the performance of the operation, and for the after-treatment are full and judicious. Dr. West does not, as a general rule, wash out the chest; and has not found that those iodine injections which greatly modify the secretion from a simple serous cyst have any influence on that poured out by a pyogenic membrane. But whenever the discharge is specially offensive, he washes out the pleural cavity first with warm water, and afterwards with a weak solution of iodine or carbolic acid, either of which greatly lessens any bad odour.

Dr. West is, with Dr. Fuller,¹ an earnest advocate, in the treatment of heart disease, especially in childhood, by "long-continued absolute rest in the recumbent posture for many weeks, and then for many months more none but the gentlest movements; and for a year or more the being carried up and down stairs; and for several years more no violent exertion, no running, no dancing." The strict observance of these precautions he has known to be followed by the disappearance of the signs of valvular insufficiency, by the lessening of the area of dulness, and by the complete cessation of the morbid sound which had accompanied the heart's action. Although it is confessedly difficult to have such a regime conscientiously carried out, the result, which it gives hopes of attaining, certainly demands the exertion of an effort for its accomplishment.

We have thus briefly noticed some of the principal additions to this edition, and have made several short extracts from it which serve the double purpose of giving the reader the author's views of the various subjects, and a slight idea of the very frank and attractive way in which he presents them. The book is a mirror of the author's vast clinical experience, and a careful perusal of its pages shows that he has liberally shared with his readers the advantages of his quarter of a century of practice and careful observation. I. M. H.

ART. XXIX.—*Reports of American Hospitals for the Insane.*

BELIEVING that few of our readers will look to this Journal for the statistics of every hospital, and that the simple yearly records of uneventful usefulness—precious as they are to the friends of the afflicted and honourable to their caretakers—present little matter for comment or criticism, we shall not attempt formal notice of every Report sent us, but direct attention to those only in which we find accounts of important changes or discussions of interesting questions.

1. *Pennsylvania Hospital for the Insane*, for 1873.—This report contains a full description of a new building, just finished, for which the institution is indebted to the beneficence of the late Joseph Fisher. The present is the second edifice built out of his original bequest with accumulated interest. Together, these structures form a noble monument to the giver; and, bearing his name, may, we hope, inspire others to emulate his judicious liberality.

Increased accommodation for the insane is the subject of an earnest appeal by Dr. Kirkbride. Of the need there is no question; nor of the imperative duty which it creates. Even in the best of homes, insanity, as a general thing, cannot be successfully treated. In the houses of the poor, any approach to

¹ St. George's Hospital Reports, 1870, vol. v.; also No. of this Journal for Oct. 1871, p. 501.

proper care and treatment is impossible. Of the insane in almshouses and jails, we know but too well the hopeless miseries. Hospitals, especially designed for their purpose, and of sufficient capacity to shelter all, are the only proper resource. But until such accommodation is made, ample enough for the whole of this unfortunate class in the State, the hospitals are justified in giving preference to curable or recent cases. In connection with the existing deficiency of hospital capacity, Dr. Kirkbride sets forth with great force the claims of that large and worthy class who are far from rich but who have always been independent. People of this sort have an honourable horror of pauperizing their relatives. They cannot possibly afford to pay the lowest cost of maintenance in a private asylum. But they can pay, and are glad to pay, the small charges made in the State hospitals. Now, is it not monstrous to compel such persons, most of whom have paid taxes for the support of these institutions, to forego the curative, or even the custodial, privileges of a hospital, just to make room for those whose only superior claim is their pauperism? Are the occupants of jails and almshouses to be relieved to the exclusion of the independent poor? Surely we should do nothing to destroy the honest pride of the family that finds itself staggering under a burden grievous to be borne. Yet some among us would expel from our hospitals the insane whose friends pay a small amount for board, or compel them to become paupers.

Like all his brethren in the specialty, Dr. Kirkbride earnestly deprecates the placing of insane convicts in hospitals designed for the worthy and unfortunate. Even if a building detached from the main hospital were devoted to this class, the mere proximity and the association under one name would cruelly afflict and humiliate many innocent persons, and do much to perpetuate and intensify the too prevalent tendency to consider insanity a disgrace. Moreover, insane convicts, as a class, can be confined only by buildings, appliances, and discipline suited to crime and its punishment rather than to disease and its alleviation. Until the number of insane convicts warrants the erection of a special hospital, a building or ward in one of the penal institutions should be set apart for them.

The whole of this report may be profitably read by all who would know the right in regard to recent questions and discussions in Pennsylvania relating to the insane.

2. *Western Pennsylvania Hospital*, for 1873.—The report before us exhibits the results of two different hospitals, under one general name and government. One, for the treatment of medical and surgical cases, is situated in Pittsburg; the other, exclusively for mental diseases, is in a suburb called Dixmont. The managers and superintendent of the latter strongly protest against the admixture of insane convicts with their worthy and respectable inmates. They also successfully refute charges recently made of improper motives in the selection of patients to be admitted or retained.

3. *State Hospital for the Insane at Danville*, for 1873.—The present is the first report of this noble institution. Only the centre building and a portion of each wing are as yet completed. From the full description given, we judge that the arrangements and appliances are well adapted to their object, and that the materials and workmanship are good. Dr. Schultz makes some very just and instructive remarks upon the sources of error which vitiate the statements of friends as to the causes and the duration of insanity in the patients whom they bring to the hospital. The qualifications and the merits of the immediate attendants on the insane are also well described.

4. *Butler Hospital for the Insane*, Providence, Rhode Island, for 1873.—We are glad to learn that this institution, which, like the "Pennsylvania Hospital,"

is a corporate charity, has, like the latter, recently received a munificent gift for the erection of additional wings. Alexander Duncan, Esq., a trustee from the beginning, has added another to the long catalogue of his benefactions to this hospital, by giving it \$30,000 for building purposes. A condition is made that an equal sum shall be subscribed as an addition to the permanent funds. The trustees, desirous to keep step with the progress of the times, have adopted plans which when executed will afford provision for excited and violent patients, such as are equalled in few hospitals in the country, and surpassed by none. The new structure is to be called the "David Duncan Ward," to commemorate the name of a deceased son of the donor, who was himself a trustee, and a warm-hearted, generous friend of the hospital.

In this, as in most other American hospitals, many patients are received at a rate of board much less than the average cost. Even the lowest charges, however, are a heavy burden to some families. Dr. Sawyer suggests to the benevolent, the creation of a beneficiary fund, whereby persons may be assisted in the maintenance of insane relatives without that sense of degradation which attends the reception of State or town aid.

5. *Longview Asylum, Ohio, for 1873.*—In this State institution, as in nearly every one in the country, we meet the same complaint of overcrowding. The wards are so thronged as seriously to interfere with proper classification, to impede the curative work of the hospital and diminish the comfort of the patients. Obliging two or three patients to sleep in rooms designed for one, is every way most unsafe and objectionable.

Dr. Webb adverts to the evils of allowing the epileptic insane to be scattered about among other patients.

A brief but violent epidemic of cholera appeared in a detached ward occupied by negroes in July last. Nine deaths occurred.

6. *Eastern Lunatic Asylum of Virginia.*—This venerable institution celebrated its centennial in November, 1873. The report before us is principally occupied with accounts of the ceremonies of that occasion. This was the earliest hospital exclusively for the insane opened in America. In contrast to the somewhat boastful tone of some of the centennial orators, we are glad to read the manly words of Dr. Brower, telling the company that their hospital, though the oldest, is far from the best, and urging them to strive for a higher grade of excellence.

7. *Northern Hospital for the Insane, Oshkosh, Wisconsin, for 1873.*—This is the first report of a new hospital. In Wisconsin, as in other States, the increase of population and of mental disease has far exceeded that of hospital accommodation. The completed portion of the building is already badly crowded; and there are patients enough now waiting to fill the remaining wards as fast as they can be finished. Dr. Kempster asks the State to provide the hospital with proper apparatus for microscopic examinations, and for photographing the results. He believes that research of this kind is the most promising path towards a more thorough knowledge and a more successful treatment of mental disease. While we agree with Dr. K. in his views of the importance of microscopic observations in the study of mental disease, we would deprecate hasty conclusions.

8. *Willard Asylum for the Insane, Ovid, Western New York.* Reports for 1872 and 1873.—This large State establishment is designed to provide for the chronic insane, otherwise exposed to the neglect and abuses sure to afflict this class when confined in jails and poorhouses. It is both natural and proper that much regard should be given to cheapness in caring for this great and increasing

multitude. In noticing a report of the Illinois commissioners of public charities, (see No. of this Journal for April, 1872), we took occasion to deny and combat the pretensions there made in favour of small, detached buildings over the existing large, congregate hospitals under one roof. In recent additions for receiving 200 patients, the trustees of the Willard Asylum have adopted plans which, while they exhibit some of the gravest objections which we urged against the Cottage System, are yet so modified from its theoretic type, as scarcely even to pretend to any special excellence but cheapness. Upon this one merit, however, very much has been claimed; but, we believe, without just ground either in fact or theory. What then is the plan which is to provide accommodations "cheaper and more becoming," to "work a favourable revolution," and which "marks a new era"? A group of five buildings have been erected, twelve hundred feet from the central hospital. One is for administrative and general purposes, having dining-rooms (two) with kitchen and heating apparatus for the whole. The others, styled dormitories, two on each side, afford sleeping and living rooms, each for fifty male patients. Being but twelve feet apart, we fail to see here any better facilities for classification, or any greater freedom from mutual annoyance, than in the different wards of a great hospital. Nor can we perceive anything very "becoming" in the spectacle of nearly two hundred patients passing through sun, rain, snow, or sleet, thrice a day to their meals. In winter, are they to leave their warm rooms bare-headed, and lightly shod; or are hats and thick shoes to be donned three or six times every inclement day? If there be covered ways, the "detached cottages" become merely a clumsily arranged hospital for two hundred men, with medical supervision, and part of its work done at a distance of a quarter of a mile. Perhaps it is hardly fair to criticize the arrangements from other standpoints than that of cheapness; but when we find the magic words "detached cottage" used, we cannot forget that these are the shibboleth of certain would-be reformers who have claimed and promised for their pet plan very much more than economy. Hence we wish our readers to notice, in passing, that these Willard groups fulfil none of the especial good purposes elsewhere described as attainable in cottages. The windows have iron sashes and guards. The charming visions of family life are hardly realized in the assemblage of a hundred men in one dining-room; nor indeed even by fifty under one roof. The group, not each dormitory, is under the supervision, non-medical, of a "gentleman and his wife of mature years and discretion;" so that each individual's share of the humanizing influence of a kind and good woman, must be very small. No word in either report gives any support to the notion of some theorists, that a great deal more work could be got out of the inmates under the "cottage plan." In one brief paragraph it is intimated that greater content and greater liberty has prevailed in the detached than in the central edifices. But there is always a large number among the chronic insane, who can safely be allowed much liberty; and probably this class especially were placed in the new structures.

Let us now look at the one advantage which is emphatically and confidently proclaimed as attained in the Willard detached group. This is cheapness, both of original provision, and of continued maintenance. Now we maintain that this can be *possible* in detached buildings *only at the price of inferiority*. There is a cheapness which is dear in the end. Common sense and universal experience establish the fact, which is indeed an axiom, that fit and lasting buildings, with adequate and proper care and provision, can be furnished for a given number of insane more cheaply under one roof than under many. The very reports before us speak of economy as the reason why the baking and

laundry work for the entire Asylum is done at the central building, and why the four dormitories of the group have a common kitchen and heating apparatus. Why not then, instead of five edifices twelve hundred feet distant, have built a new wing, and thus saved altogether the multiplication of cooking and warming arrangements?

Nevertheless, we are told, that in point of fact the Willard group for two hundred patients has proved economical, both as to original outlay and as to maintenance. Figures are given which are supposed to prove this. Now figures may be variously handled, and, without impugning the motives of the officers, we think these, as presented, are calculated to mislead. As to first cost: the estimate is \$500, obtained by dividing the cost of the group by 200, no account being taken of the share which these 200 patients have in the laundry, bake-house, and other general administrative buildings previously erected. Yet they take the \$500 as the standard of comparison with the cost of large congregate hospitals built *de novo*. In fairness it should be compared only with the cost of new wings or wards to an established hospital. Thus judged, we find it considerably more expensive than additional accommodation in one or two hospitals which we happen to know about. Recent additions to the insane department of the Blockley almshouse, in Philadelphia, cost much less; and very admirable additions to the Government hospital at Washington, about the same as the Willard group. As no plans are given, and no very minute description of the kind of accommodation provided, we have little means of judging as to the real character and fitness of the provision made.

As to the cost of maintenance, we notice that the charge for board, first fixed at \$2 per week, in 1865, was raised to \$3, in 1872. The present actual cost per patient is estimated at \$3.09 weekly, with an additional annual expenditure of \$15 for clothing. We have no doubt that patients in most State hospitals cost considerably more than this. In the city asylum, at Blockley, however, the average expense has for the last three years ranged under \$1.80 per week, *including clothing*. We can readily conceive that the class of patients supported at the Willard Asylum may be supposed not to require many things which add largely to the expense of a curative hospital. As to the matter of fact, whether at this low charge the inmates are not only made comfortable but surrounded by influences conducive to restoration or improvement, we are provided with no data upon which to decide. Nothing is told us as to the diet, mode of life, or occupation of the patients, except that a certain number of garments are made, and an uncertain amount of work done in the laundry, and other farm and household departments. When credit is claimed for cheap maintenance, we think some particulars ought to be given by which the reader may judge concerning the means by which it is achieved. Certainly the annual cost of clothing does not indicate an adequate provision for patients required to go out of doors, and indeed none too much for any class.

The distance and isolation of the "group" render impossible that close and perpetual surveillance without which abuses will inevitably occur. We notice in each report, reference to attendants being discharged for ill treatment of their patients.

9. *State Lunatic Asylum, Utica, New York.*—The managers of this institution make complaint of what has become a serious interference with the discipline and usefulness of the asylum. This annoyance is the frequent summoning of the medical officers to appear as experts, before the courts. It is justly remarked that this is one of many reasons for some radical change in the methods of obtaining expert evidence.

The Utica Asylum has set an honourable example in the matter of necroscopical research. Pathological investigation, with the aid of the microscope and of photography, is made the sole duty of a competent physician.

We doubt the wisdom of including in a report intended for general readers, and the friends of patients, the history and post-mortem appearances of a score of fatal cases, as is here done. It strikes us that such details should be separately printed, and sent only to medical men and sister hospitals.

10. *State Lunatic Hospital*, Northampton, Mass.—From a perusal of this report we learn that in Massachusetts, as in Pennsylvania, the question of the disposition to be made of insane convicts has been recognized as one of great moment. The superintendents of existing State hospitals fully realize the impropriety of associating in any way the criminal insane with the innocent. Dr. Earle too, like several of his brethren in the specialty, deems it desirable to provide separate accommodation for epileptics.

B. L. R.

ART. XXX.—*The Nature of Gunshot Wounds of the Abdomen and their Treatment: based on a Review of the Case of the late James Fisk, Jr., in its Medico-Legal Aspects.* By EUGENE PEUGNET, M.D., etc. 8vo. pp. 96. New York: William Wood & Co., 1874.

THIS brochure is an elaborate study of the once famous Fisk-Stokes case. The principal points of interest hinged upon the position and relations of the parties. Had Fisk occupied a less prominent position, or been less notorious as a type of the worst phase of American city life, he would have died unnoticed, while his assailant, in all probability, would have paid the price of his private vengeance upon the scaffold. That the case did not take this course, but became the subject of three separate trials in which much public interest was manifested, is a matter of history too recent to need recapitulation.

Dr. Peugnet gives an accurate account of the gunshot wounds received by Fisk, as revealed upon post-mortem examination, and while he shows that there were fourteen wounds of the peritoneum, he holds that they would not necessarily have proved fatal, had not unwarrantably large doses of morphia been administered. In the opinion of this gentleman, the stomach was so paralyzed at first, that the doses given by that organ were simply retained there unabsorbed, until upon recovery from the shock, which he maintains did take place, the whole amount was absorbed at once with fatal effect. The question may be possessed of much physiological interest, yet we think that no practical surgeon would hesitate to resort to similar doses in such a case, where, judging by the average rules of surgery and not from a few isolated and extraordinary instances of recovery, the probability of a fatal issue was so strong. The annals of medicine record cases of marvellous recovery and escape from imminent death, but such results do not make the rules upon which to base a prognosis, and were we to accept them as such, we should find ourselves at fault in at least ninety-nine cases out of a hundred.

The medical jurisprudence of the case occupies much of the volume, and consists in large part of an analysis of the medical evidence given in the first and third trials. The position of the parties, as shown by the holes in the cloak, the direction of the wounds, with many of the attendant circumstances are gone over in detail. Dr. Peugnet shows much ingenuity in reviewing the

legal mistakes committed by the counsel, and their failures to detect the weak points made by the opposition, showing himself much of that subtilty of mind which would probably make him an invaluable coach upon a similar occasion. As a whole we have in this little volume a valuable and creditable study of this case from the stand-point of a medical counsel, rather than from the graver and more responsible position of a medical expert. Yet we cannot avoid saying that it seems to us to be a mistake for medical men to dilate upon the *legal* points of a case, as the lawyers engaged do not ordinarily require any such assistance.

Our author's conclusions are that "the medical jurisprudence of the Stokes case proves that: 1. The shooting of Fisk was not done in self-defence, but with premeditation; and 2. The wound in the abdomen was not necessarily fatal, and that the morphia was the immediate cause of death. These thus proved an attempt to commit murder in the first degree."

In view of this as well as some other late *causes célèbres* Dr. Peugnet thinks, and in this few will be found to differ from him, that there is an urgent demand for a change in the manner of conducting ante- and post-mortem inquests by coroners, and a modification in the introduction of expert testimony into criminal trials.

S. A.

ART. XXXI.—*A Universal Formulary: Containing the Methods of Preparing and Administering Official and other Medicines. The whole adapted to Physicians and Pharmacutists.* By R. EGLESFELD GRIFFITH, M.D. Third edition, carefully revised and much enlarged, by JOHN M. MAISCH, Phar.D., Professor of Materia Medica and Botany in the Philadelphia College of Pharmacy. With illustrations. 8vo. pp. 779. Philadelphia: Henry C. Lea, 1874.

THIS work has been so long popular with both physicians and apothecaries, in this country, for its extensive and useful collection of medicinal formulæ and pharmaceutical preparations, that it is merely necessary at this time to indicate the changes made in the present edition, which has undergone the careful revision of the able Professor of Materia Medica and Botany in the Philadelphia College of Pharmacy.

All the numerous improvements in manipulations and processes which have been made since the publication of the previous edition, and all the new remedies of real merit are described by Prof. Maisch, and the work fully brought up to the present times. Such formulæ as have become obsolete are omitted, yet notwithstanding their omission, the volume has been enlarged by considerably more than one hundred pages.

It will thus be evident that the changes and additions of the present editor are most important, and must greatly increase the usefulness and popularity of the work.

QUARTERLY SUMMARY

OF THE

IMPROVEMENTS AND DISCOVERIES

IN THE

MEDICAL SCIENCES.

ANATOMY AND PHYSIOLOGY.

1. *Bartholow's Experiments on the Human Brain.*—Dr. FERRIER, in commenting upon Dr. Bartholow's experiments on the human brain (see No. of this Journal for April, 1874, page 305), states (*London Medical Record*, May 13, 1874) that, whatever opinion may be entertained as to their propriety, they furnish facts of great interest in relation to the physiology of the brain. The point at which the needles were inserted (the postero-parietal lobule) corresponds homologically with that region of the brain in monkeys which he, Dr. F., has shown to be a centre for the leg. In close relation to this in the ascending parietal convolution, and in the upper part of the ascending frontal in advance of the fissure of Rolando, are centres for movements of the arm and hand. The method followed by Dr. Bartholow, of pushing the needles into the brain-substance, favours diffusion of the current, so that the conjoint movements of the arm and hand may be looked upon as the simultaneous excitation of different individual centres. The results, however, are otherwise quite in accordance with what one would have reason to expect from irritation in this region. They distinctly bear out the anatomical and physiological homology of the brain of man with that of the monkey and lower animals. Owing to the depth of penetration of the needles, there is reason to believe that the stimulation reached the cerebral centres of the tactile nerves, which he has given grounds for supposing to be near this region. This would account for the tingling and painful sensations experienced in the extremities of the opposite side. Of further interest is the occurrence of epileptic convulsions from general diffusion of the irritation when the currents were intensified. This is entirely in accordance with his observations, and the phenomena of the seizure are a complete parallel to the results in the lower animal which he has elsewhere recorded. The subsequent spontaneous occurrence of epileptic convulsions and ultimate paralysis are clearly accounted for by the inflammatory changes, at first causing irritation and then proceeding to annihilation of the function of the cortical centres, without affection of the lower ganglia. Precisely the same effects are observable in the lower animals.

[We take pleasure, in justice to Prof. Bartholow, in giving place here to the following candid letter addressed by him to the Editor of the *British Medical Journal*, and which is published in the No. of that excellent periodical for May 30th, and which, as the editor remarks, "is, we believe, one which is likely to disarm further criticism."]

"SIR: A case of epithelioma exposing the brain on which I ventured to make some experiments, has excited unfavourable comment in your widely circulated Journal and elsewhere. Under these circumstances, I beg to offer

some explanations, which, whilst they do not justify the experiments in question, at least, it appears to me, put the matter in a less offensive shape.

"1. The patient was hopelessly diseased, with a rodent ulcer, which had already invaded the dura mater. The ulcer was rapidly extending, and threatened an early extinction of life.

"2. The patient consented to have the experiments made.

"3. It was believed that fine insulated needles could be introduced without injury that would affect the progress and termination of the case, for the following reasons. The brain has been incised to permit the escape of pus, a notable and successful example of which has recently occurred in London. Portions of the brain-substance have been lost, and yet the patient survived; for example, the Massachusetts case, in which a tamping-iron was driven through the brain, the patient recovering, and dying many years afterwards of another malady.

"4. The faradic current was used; and this has, as is well known, no electrolytic action.

"5. The fatal result was attributable to the progress of the epithelioma. The erosion of the skull already had existed thirteen months. The thrombus found *post-mortem* in the longitudinal sinus could not have been caused by the needles, which were introduced some distance from it on each side.

"Notwithstanding my sanguine expectations, based on the facts above stated, that small insulated needle electrodes could be introduced without injury into the cerebral substance, I now know that I was mistaken. To repeat such experiments with the knowledge we now have that injury will be done by them—although they did not cause the fatal result in my own case—would be in the highest degree criminal. I can only now express my regret that facts which I hoped would further, in some slight degree, the progress of knowledge, were obtained at the expense of some injury to the patient."

2. *Further Researches on the Localization of Function in the Brain.*—In a paper read before the Royal Society on March 5, Dr. FERRIER gave the results of an experimental investigation, tending to prove that there is a localization of function in special regions of the cerebral hemispheres.

In a former paper published by the author in the *West Riding Lunatic Asylum Medical Reports*, vol. iii. 1873, the results were given of experiments on rabbits, cats, and dogs, made specially for the purpose of testing the theory of Dr. Hughlings Jackson, that localized and unilateral epilepsies are caused by irritation or "discharging lesions" of the gray matter of the hemispheres in the region of the corpus striatum. Besides confirming Hughlings Jackson's views, the author's researches indicated an exact localization in the hemispheres or centres of regions for the carrying out of simple and complex muscular movements of a definite character, and described by him as of a purposive or expressional nature.

Facts were also recorded tending to show that other regions of the brain were connected with sensory perception, but no localization was definitely arrived at.

Among the experiments now related are some in further confirmation and extension of those already made on cats, dogs, and rabbits, as well as a new series of experiments on other vertebrates. In particular, numerous experiments on monkeys are described, for the purpose of which the author received a grant of money from the Council of the Royal Society. In addition, the results of experiments on jackals, guinea-pigs, rats, pigeons, frogs, toads, and fishes are narrated.

The method of investigation consists in the application of the stimulus of an induced current of electricity directly to the surface of the brain in animals rendered only partially insensible during the process of exploration—complete anaesthesia annihilating all reaction. It is supplemented by the method of localized destructive lesions of the hemispheres.

Special attention is called to the precision with which a given result follows stimulation of a definite area; so much so, that, when once the brain has been accurately mapped out, the experimenter can predict with certainty the

result of stimulation of a given region or centre. The theory that the phenomena are due not to excitation of cortical centres, but to conduction of the electric currents to basal ganglia and motor tracts, is considered as disposed of by the fact of the precision and predictable characters of the results, and by the marked differences in the phenomena which are observed when regions in close local relation to each other are excited. Other facts are pointed out, bearing in the same direction; among others, the harmony and homology subsisting between the results of experiment in all the different animals.

The experiments on monkeys are first described.

Reference is made in the description to the figures of the brain, on which are delineated the position and extent of the regions, stimulation of which is followed by constant and definite results.

Generally it may be stated that the centres for the movements of the limbs are situated in the convolutions bounding the fissure of Rolando, viz., the ascending parietal convolution with its postero-parietal termination as far back as the parieto-occipital fissure, the ascending frontal, and posterior termination of the superior frontal convolution. Centres for individual movements of the limbs, hands, and feet are differentiated in these convolutions.

Further, in the ascending frontal convolution, on a level with the posterior termination of the middle frontal, are centres for certain facial muscles, *e. g.*, the zygomatic, etc. At the posterior termination of the inferior frontal convolution and corresponding part of the ascending frontal are the centres for various movements of the mouth and tongue. This is the homologue of "Broca's convolution." At the inferior angle of the intraparietal sulcus is the centre for the platysma.

In the superior frontal convolution, in advance of the centre for certain forward movements of the arm, as well as in the corresponding part of the middle frontal convolution, are areas, stimulation of which causes lateral (cross) movements of the head and eyes, and dilatation of the pupils.

The antero-frontal region, with the inferior frontal and orbital convolution, give no definite results on irritation. Extirpation of these parts causes a condition resembling dementia.

No results could be ascertained as regards the function of the central lobe or Island of Reil.

Irritation of the angular gyrus (*pli courbe*) causes certain movements of the eyeballs and pupils. Destruction of this convolution gives data for regarding it as the cerebral expansion of the optic nerve, and as such, the seat of visual perception.

The phenomena resulting from irritation of the superior temporo-sphenoidal convolution (pricking of the ear, etc.) are indications of excitation of ideas of sound. It is regarded as the cerebral termination of the auditory nerve. The sense of smell is localized in the uncinate convolution. The situation of the regions connected with sensations of taste and touch is not accurately defined, but some facts are given indicating their probable locality.

The occipital lobes do not react on stimulation. Destruction of these lobes caused no loss of sensation or voluntary motion, but an apparent abolition of the instincts of self-preservation.

The corpora striata are shown to be motor in function, and the optic thalami sensory.

Stimulation of the corpora quadrigemina causes dilatation of the pupils, opisthotonic contractions; and the utterance of peculiar cries when the *testes* alone are irritated. The nature and signification of these phenomena are regarded as still obscure, and requiring further investigation.

Some experiments have been made on the cerebellum of monkeys. They confirm the author's previous views as to the relation of this organ to co-ordination of the optic axes, and the maintenance of bodily equilibrium. The experiments are not detailed, as they will form the subject of a future paper.

New experiments on dogs essentially confirm those already published, while many new facts have been elicited. Those on jackals agree in the main with

the experiments on dogs, both as to the character of the results and the localization of the centres. New experiments on cats generally confirm, as well as further define, the results described by the author in his former paper. The facts of experiments on rabbits, guinea-pigs, and rats are essentially alike, and also confirm former statements.

In all those animals, the sensory regions are defined, and their position compared with those in the brain of the monkey.

The only result obtained by the stimulation of the cerebral hemispheres in pigeons was contraction of the pupil. The region associated with this action, situated in the postero-parietal aspect, is compared with a similar region in the mammalian brain, and regarded as the seat of visual perception.

Movements of the limbs in frogs, and of the tail and fins in fishes (as in swimming), can be excited from the cerebral hemispheres in these animals. Exact localization of motor and sensory centres is not possible.

The optic lobes in birds, frogs, and fishes seem related to movements of flight and progression, in addition to their relation with the eyes. Similar phenomena result from irritation of the cerebellum, but the significance of these is reserved for future inquiry.

From the data of physiological experiment, a foundation is obtained for constructing an anatomical homology of the convolutions.

Among other points in homology the fissure of Rolando is shown to be the homologue of the crucial sulcus in the brain of the carnivora.

The whole brain is considered as divided into a sensory and motor region, corresponding to their anatomical relation to the optic thalami and corpora striata, and the sensory and motor tracts.

The motor regions are regarded as essential for the execution of voluntary movements, and as the seat of a corresponding motor memory (motor ideas), the sensory region being looked upon as the organic seat of ideas derived from sensory impressions. An explanation is attempted of the phenomena of aphasia, and the relation of the memory of words to the ideas they represent.

The theory that a certain action, excited by stimulation of a certain centre, is the result of a mental conception, is considered and disputed. From the complexity of mental phenomena, and the participation in them of both motor and sensory substrata, any system of localization of mental faculties which does not take both factors into account, must be radically false. A scientific phrenology is regarded as possible.

The paper concludes with a short consideration of the relation of the basal ganglia to the hemispheres. The view is adopted that they constitute a sub-voluntary or automatic sensori-motor mechanism.—*London Medical Record*, March 18, 1874.

3. *Neuropathic Origin of Simple Hydruria (Diabetes Insipidus) from Epidemic Cerebro-spinal Meningitis, Trauma, and Syphilis.*—Professor MOSLER states that from physiological experiments it seems likely that different parts of the medulla oblongata are concerned in the production of excess of urine on the one hand, and the sugar in the urine which is the characteristic phenomenon of diabetes mellitus on the other. At least, experiment has shown that both conditions may arise from affections of the nervous centres. In the present paper the author gives some cases in which the occurrence of polyuria or diabetes insipidus is ascribed to affections of the brain. The first case was one in which after an attack of epidemic cerebro-spinal meningitis there remained increase of the quantity of urine passed. In this case the local disease had probably produced some structural change in the fourth ventricle or its neighbourhood. The second case is one in which a similar symptom resulted from a fall on the head. In this case the polyuria was probably due to hemorrhage into the fourth ventricle with rupture of the brain substance, the healing of which would leave a cicatrix. The symptom lasted 14 years, and was much benefited by large doses of acetate of lead combined with opium. The author has found acetate of lead a very efficient means of causing contraction of the vessels of the kidney, and he gives it with great advantage in catarrhal pyelitis. The third case is one of syphilis, in which polyuria was the first symptom of

sypilitic disease of the brain. There followed various other cerebral symptoms, such as epileptiform convulsions, and after death there was extensive softening in the left hemisphere, in the medulla oblongata and the pons.—*Glasgow Med. Journ.*, Jan. 1874, from *Virchow's Archiv*, July, 1873.

4. *Changes in the Muscular Tissue, after Division of Nerves.*—Professor BIZZOZERO and C. GOLGI were engaged in experiments having a different object when they lighted on the curious observation given in this paper. In some cases where the nerve supplying a muscle had been cut, they found that the muscular fibre had nearly or completely disappeared, while the muscle, as a whole, was even increased in size. The proper muscular tissue had been replaced by fatty tissue. This observation may be of some consequence in relation to paralysis pseudo-hypertrophica.—*Glasgow Med. Journ.*, Jan. 1874, from *Stricker's Med. Jahrbücher*, part 1, 1873.

5. *On Diapedesis.*—Prof. J. ARNOLD, of Heidelberg, gives the results of a large number of experiments made on the frog's tongue, with the view to determining the mode of escape of blood-corpuscles from the vessels after obstruction of veins. He ligatured either the central or lateral veins of the tongue, and then submitted the capillaries which feed these to microscopic examination. There was, doubtless as a result of the obstruction of the vein, greatly increased pressure within the capillaries, and this seemed to manifest itself in the form of numerous minute bulgings or pouches out from the vessels. Further, he saw how the red, and (more rarely) the white blood corpuscles were made to slip through the vessels, this process of diapedesis being apparently a passive one, and due to the increased pressure in great measure. Thus he observed, how when a red blood corpuscle had got through the wall there was generally a current of fluid from the vessel through the same aperture, till it got filled again by a fresh corpuscle. But that diapedesis is passive seemed also to be shown by the fact that when finally divided vermilion was previously introduced into the circulation, it also escaped through the same channels as the red blood corpuscles. Again on injecting the vessels after death, in cases which had already been the subject of observation, with a blue coloured solution of gelatine, he found that it also escaped from the capillaries, and that often by a channel in which a blood corpuscle was sticking. Then further, when the capillaries were stained in the usual way with a silver solution, there were found to be numerous dark points and circles visible in the internal surface which were always at the borders of the endothelial plates. The circles at least were apertures through which blood corpuscles had escaped. The question arises, however, whether any openings exist in the capillaries normally, and these are only enlarged when the pressure is increased—or whether they are entirely produced by the increased pressure. The author, from his observations, concludes that there are normally in the capillaries minute apertures between the endothelium cells which he names stigmata, and that under the conditions presented they enlarge and give passage to the blood corpuscles; these enlarged stigmata he would name stomata. The second part of the paper before us is taken up with the fate of the corpuscles which have been pushed out of the vessels. As will be noticed, the escape of these corpuscles is a purely passive process, not a wandering out, and after they have left the vessels they may be carried away from them to a distance by the currents which rush through the stomata when a corpuscle leaves one for a moment empty. In their subsequent course the corpuscles are still passive. The author describes somewhat minutely how, either isolated or in groups, they gradually lose their colouring matter, and finally disintegrate. During the process of decolourization the groups of red blood corpuscles often look delusively like large colourless cells with red blood corpuscles inside it, but this the author says is not the case, and he believes the corpuscle-holding cells of some authors to be really groups of red blood corpuscles undergoing these changes. The corpuscles sometimes, though rarely, form solid pigment, either in granules or in needles. Lastly, the author has not been able to discover any other mode of disappearance of the exuded blood corpuscles than that above described. They may, however, in

part, be carried into the lymphatics, for anything he knows.—*Glasgow Med. Journ.*, Jan. 1874, from *Virchow's Archiv*, Aug. 1873.

6. *Origin of the Bile-ducts*.—At the late meeting of the German Association at Wiesbaden, Professor KUPFFER, of Kiel, described certain new points in the histology of the mammalian liver, which should prove as interesting as they are new to most anatomists. By the injection of the bile-ducts and bile-capillaries, small cavities or vacuoles may sometimes be filled within the liver-cells, which are connected with the bile-capillaries around the corresponding cells by means of excessively delicate canals. The appearance presented by a good specimen of injected liver is that of a number of small stalked buttons attached to the bile-capillaries, the stalks being, as a rule, somewhat bent. Hering, who has advanced the knowledge of the hepatic structure so considerably, has not failed to see these knobs, but believes them to be accidental extravasations within the substance of the cell. The regularity of the appearance, however, and the presence of the delicate canal of communication, support the view advanced by Kupffer. This anatomist recognizes in the intra-cellular spaces secreting vacuoles or capsules, from which the bile flows into the capillaries. The liver-cells which are furnished with such vacuoles would therefore closely resemble the capsule-cells discovered and described by Kupffer in the salivary glands of some insects.—*Med. Times and Gaz.*, Feb. 14, 1874.

7. *Contributions on the Structure and Functions of the Bladder*.—According to Dr. G. JURIÉ, the arrangement of the muscular layers of the bladder and their relation to the internal sphincter urethræ are as follows: The external layer is the strongest, and it passes longitudinally from above downwards, being especially developed on the anterior and posterior surfaces. The middle layer is transverse but slightly oblique, the posterior bundles passing downwards and forwards and the anterior downwards and backwards, so that they cross somewhat. The internal layer is longitudinal but not very powerful. It is most developed at the upper end of the bladder, disappearing altogether at the level of the entrance of the ureters. The powerful external longitudinal layer is in part inserted at its lower extremity into the internal sphincter, so that when it comes into action it will draw asunder the sphincter and open the orifice. This sphincter is thus relaxed, not by the pressure of the fluid but by the direct action of the longitudinal muscular layer. A further point is that the entrance of the ureters was shown to be valved not only by the oblique passage through the mucous membrane, but also by the passage through the muscular coat. When the mucous membrane was cut away, and pressure exercised on fluid in the bladder, there was no escape through the ureters. It would thus seem that the contraction of the muscular coat of the bladder has a direct influence in closing the ureters and preventing regurgitation during the emptying of the bladder.—*Glasgow Med. Journ.*, April, 1874, from *Stricker's Medizinische Jahrbücher*, Part IV., 1873.

8. *Bladder with a Pouch communicating with a Third Ureter*.—Mr. FLETCHER BEACH showed to the Pathological Society of London a case of this nature, occurring in a child aged 5 years. She had been healthy till six weeks previously, when there was a difficulty in micturition, which increased, and death ensued. *Post mortem*, a third ureter, opening below with a pouch near the bladder, filled with pus, was discovered.—*Brit. Med. Journ.*, May 16, 1874.

9. *Ovulation without Menstruation*.—M. DE SINÉTY stated at the Biological Society of Paris (25 April, 1874) that he had observed on the surface of the ovary of a woman who had died of phthisis, and who had not menstruated for five months, a ruptured Graafian vesicle. Ovulation had thus continued in the absence of menstruation.—*Revue Scientifique*, May 2, 1874.

MATERIA MEDICA, GENERAL THERAPEUTICS,
AND PHARMACY.

10. *Jaborandi, a new Sudorific and Sialogogue*.—Recent French journals (*Revue Scientifique*, April 18, *L'Union Médicale*, April 14 and May 9, and *Gaz. Hebdom.*, April 10) contain notices of a new and powerful sudorific and sialogogue brought to Paris by Dr. S. COUTINHO, of Pernambuco. This new therapeutic agent is the leaves of a shrub growing in Brazil, the botanical characters of which have not yet been satisfactorily established. M. RABUTEAU, who has made a chemical analysis of these leaves, and experimented upon their physiological properties, failed to attain any evidence of an alkaloid in these leaves, or the presence of any organic base. The quantity of leaves furnished Mr. R. was so small that he could not carry his investigations as far as he desired, and awaits a further supply to enable him to continue them. All of the leaves which remained weighed 2.90 grammes, and these Mr. R. reduced to powder, and about 10 o'clock in the evening of the 6th April, he prepared a teacupful of an infusion of them, which he took when nearly cold; one-half of it alone, the other half with the addition of a little sugar; this addition was not, however, necessary, as the taste of the infusion was not disagreeable. Ten or fifteen minutes after he had taken the medicine, Mr. R.'s forehead became moist, and he went to bed. Sweating speedily came on, and at the same time profuse salivation, which continued for nearly two hours. There was scarcely any abnormal heat, nevertheless the temperature was highest when the effects of the medicine were most active—three-quarters of an hour after taking the infusion. After changing his wet shirt, Mr. R. slept well.

Mr. R.'s latest experiments show that the bitter substance of the *jaborandi* is the active sialogogue and sudorific principle; and that the sialogogue effects are most readily manifested, since they are most marked when the active principle has been taken in a very small dose; and, finally, that when the dose is larger, the sudorific effects are increased.

M. GUBLER has also tried this drug at the Hôpital Beaujon, and reports that it has always acted as a powerful diaphoretic and sialogogue. Its action becomes evident a few minutes after it has been taken, and almost with certainty. Very soon after it is administered, the sweat rolls down the face and the whole surface of the body. The saliva flows in such abundance that articulation becomes almost an impossibility; as much as a pint and a half has been collected in less than two hours. At the same time the bronchial secretion has been observed to increase, and in one or two cases diarrhœa supervened. It is a remarkable fact, that the employment of heat, as M. Coutinho has remarked, has but a slight influence in the production of the sudorific effects of *jaborandi*. Whilst it is of paramount importance where our indigenous sudorifics are concerned, it is certainly not unavailing to administer *jaborandi* in a very hot infusion, and to cover the patient up warmly in bed; but these conditions are by no means necessary to develop the power of the new sudorific. Thus in one experiment, a person, who is by no means subject to sweatings, produced a copious perspiration in himself, by taking a glass of *jaborandi* scarcely warm, while he was going about his ordinary business. M. Gubler believes that a great future is in store for this new remedy, which he considers to be the first incontestable specimen of a diaphoretic truly worthy of the name, that is to say, of a medicament having the power of directly inducing the secretion of sweat by an elective action—by a special stimulation of the sudoriparous apparatus. The form of administration is from four to six grammes of the leaves in a cup of warm water, or if given in cold water the same results ensue.

11. *On Eucalyptus and its Febrifuge Qualities*.—Dr. E. BURDEL, Physician to the hospital at Virgion, records in the *Revue des Sciences Médicales*, April, 1874, the results of his observations on the action of *eucalyptus* in the Sologne.

In the note under consideration, upwards of thirty-three cases are reported, in which *eucalyptus* was successful in eighteen instances. M. Burdel believes

that he can now, after two years' experience, by bringing together the facts which have occurred under his observation, arrive at the following conclusions with regard to the employment of eucalyptus.

The action of this remedy, which may certainly be considered a febrifuge, is slow and far from being always constant. In mild intermittent fever, eucalyptus is successful in four-fifths of the cases; in tertian, in three-fifths only; and, finally, in quartan fevers, it almost entirely fails: that is to say, in eight-tenths of the cases. In the seasons when intermittent fever is most frequent—that is to say, endemic—relapses are much more common when eucalyptus is used than when recourse is had to quinia. Relapses may, however, be avoided by administering eucalyptus more frequently after some days' rest only, and in as large doses as the stomach will tolerate. This remedy is perfectly inert in palustral cachexia. Finally, M. Burdel believes that in the second year of his experiments he obtained a rather larger proportion of cures and a smaller number of relapses, because he gave the eucalyptus in conjunction with good wines, iron, and quinia, and kept the organism up to its work by frequently repeated doses. Dr. Burdel administered the alcoholic extract of eucalyptus in pills, each containing 15 centigrammes, to the number of from four to ten daily, according to the form of the fever, given twice during the day.—*London Med. Record*, May 13, 1874.

12. *Action of Chloroform*.—Dr. POLLAK gives the following as his conclusions on this subject:—

1. Chloral is a very good hypnotic, and in all those diseases which consist in abnormal cerebral excitement, or are combined with this, it by its soporific influence constitutes a good calming medicine. 2. It relieves pain by the fact of inducing sleep, but will not relieve pain without causing sleep. In very intense pain it exerts but little hypnotic effect, and in such cases is advantageously combined with morphia. 3. As it induces relaxation of muscles, both voluntary and involuntary, it is an excellent means in the various forms of spasm. 4. In disease of the heart and lungs and of the digestive canal, chloral is without effect or unsuitable or even dangerous, and consequently is contraindicated, or should only be employed with caution. 5. It does not admit of being used as an anæsthetic during the execution of the great operations. 6. Its prolonged employment is not usually attended with any disagreeable effects, and if any occur, they are not of any consequence. It especially does not induce congestion of the brain or disturbance of the digestive and nutritive processes. 7. It is in most of the diseases in which it is employed an excellent palliative, but on the disease itself it usually exerts no influence. Chloral is especially indicated in the cases in which morphia is indicated, and when the latter on account of some of its effects cannot be administered. It is contraindicated in diseases of the heart and lungs and of the digestive canal. 8. Comparing chloral with morphia and chloroform, we may assert (1) that as a soporific agent its operation is more certain and less disagreeable than is that of morphia, which it will succeed in displacing as a hypnotic; (2) that it only relieves pain by inducing sleep, and fails to remove intense pain, so that as an anodyne it cannot supersede morphia; (3) and that as an anæsthetic it is far inferior to chloroform both in rapidity and intensity. 9. Although chloral has rightly obtained admission into the *Materia Medica*, it has not yet acquired its definitive place. Notwithstanding the numerous communications that have been made respecting it (the author is cognizant of the writings of 312 authors upon the subject), much more has yet to be worked out respecting its chemical, physiological, and therapeutical relationships before the "chloral question" can be said to be completely settled.—*Med. Times and Gazette*, April 11, from *Wiener Med. Woch.*, Feb. 28, 1874.

13. *Studies on Ether and Chloroform*.—Dr. T. G. HAKE gives (*The Practitioner* April, 1874) an interesting account of the observations made by Prof. SCHIFF, of Florence, on the action of ether and chloroform. These observations, though instituted solely for the advancement of physiological science, have a direct practical bearing on surgical practice. Prof. S. states in his

work (*Sopra il metodo seguito negli esperimenti sugli animali viventi*): "We adopt ether and not chloroform because a very extensive experience has shown that etherization pushed to the very last stage of insensibility is never dangerous to life so long as one maintains the act of respiration. And even if one presses the inhalation of ether yet further, so that the respiratory movements cease, or, in other words, the appearance of death is complete, life is never menaced, if only at the moment of the paralysis of the thoracic walls inhalation is interrupted and a species of artificial respiration is immediately commenced by means of periodic compression of the thoracic parietes themselves.

"Chloroform has been preferred to ether because it acts more quickly, and its use is more agreeable to the patient, who dislikes the odour of ether. But chloroform has a paralyzing action much greater than that of ether, and in like manner, at least in man and the mammalia generally, has a special influence on the nerves of the heart and of the vessels. If chloroform is pushed so as to produce a considerable weakening of the respiratory movements, the interruption of the inhalation may, in a majority of cases, lead to the re-establishment of respiration and afterwards of sensation; but sometimes, a short time after the commencement of inhalation, the force of the circulation is so enfeebled that it no longer renews, fast enough, the blood in the lungs. The blood of the body no longer comes into necessary contact with the atmospheric air introduced by respiration into the lungs.

"Death is sometimes sudden, but it may be preceded more or less by signs of sinking of the pressure of the blood in the vessels. The cases in which paralysis of the circulation shows itself while respiration continues are comparatively rare, but the annals of human surgery record many examples, and we have ourselves observed some in animals. If the action of chloroform is prolonged until respiration ceases, we are not even sure of being able to revive the individual after having re-established the respiratory movements, for these often again cease owing to the disturbance of the circulation, while these same movements, if restored after the inhalation of ether, become *always* more frequent in the individual when left to himself.

"We are able to say that in the present state of science the medical man is responsible for every case of death occasioned by the application of ether, because a careful watching of the respiration is capable of preventing death, whilst the lethal effect of chloroform depends in part on individual predisposition which the physician is unable to recognize."

Dr. Hake states that "To explain this latter statement, it should be understood that both ether and chloroform, pushed to the last stage of their action, give rise to paralysis of the respiration, vessels, heart and motor nerves, but that ether invariably produces its effects in the order of sequence now given (life of course being sustained in all cases by artificial respiration when automatic breathing has ceased); while chloroform sometimes produces paralysis of the vessels in the first instance, then of respiration, and finally of the heart. The result of the action of chloroform is thus variable; it frequently happens that its effects manifest themselves in the same order of sequence as those of ether, only much more rapidly; and it also happens that they follow each other in an inverse order as respects the first two phenomena, paralysis of the respiration and of the vessels. It is this variable action of chloroform which the physician is unable to foresee and to provide against in individual cases, and to which the danger to life is traceable. Very often at the beginning of the inhalation of chloroform by the trachea the vessels become at once paralyzed, the pulse is insensible, and death follows rapidly with a deep inspiration. All this Professor Schiff has frequently verified by experiments on dogs and rabbits, in which during inhalation the manometer has been constantly in connection with the carotid artery.

"That the heart is the last of these three factors of life which dies, the Professor clearly demonstrates in the following way. When by the action of the chloroform the pressure has gone down nearly to zero, and there is no pulsation visible, compression of the thoracic aorta between the crura of the diaphragm, or the mere compression of the abdomen, restores to the pulse its strength and frequency, and causes the pressure in the manometer to rise to a considerable

height, very often to 100 or 120 millimetres. This fact proves that the heart, notwithstanding its apparent paralysis, is still able to maintain the almost normal pressure of the blood, and to contract with more strength than before when the pressure is acting upon its walls and opposing itself to their contraction. The apparent paralysis must depend on this cause; the vaso-motor nerves are paralyzed, inasmuch as all the vessels of the body are dilated; their increased capacity retains the blood, now no longer returned to the heart, which becomes bloodless in a secondary manner. Compression of the abdomen, or ligatures to the upper and lower extremities, produces a compensation for the increased capacity of the bloodvessels, and in this way the circulation becomes more normal, while before it had suffered, not through paralysis of the heart, but from paralytic dilatation of the peripheral vessels."

As regards the comparative value of ether and chloroform, Professor Schiff continues: "Our own experiments bearing on this argument enable us to say that in more than three thousand cases we have adopted etherization with a view to preserve the life of animals, and that with the few exceptions indicated elsewhere (Memoir on the Laryngeal Nerve), not a single case of death occurred. On the other hand, chloroform has cost us a considerable number of animals when I have wished to push *anæsthesia* to its ultimate stage.

"Our experiments confirm more and more that in etherization the pressure of the vessels maintains itself to a height almost normal and always compatible with the continuance of life even after the cessation of automatic and the substitution of artificial respiration, so that the mere continuance of breathing gives us a safe warranty of the vitality of the individual. Often in experiments made with this view, we have seen that at the moment of the cessation of automatic breathing the circulation was still in so normal a state that the commencement of asphyxia indicated still the *asphyxic height* of vascular pressure as measured by the manometer; that is, instead of falling before death, the pressure rose through the accumulation of carbonic acid, which, as is known, is an irritant of the vascular system and of its nerves.

"When, after the cessation of breathing, one at once applies artificial respiration with air that is passed over a stratum of ether, so that etherization is still kept up, one is able, by regulating the quantity of ether that is mixed with the air, to continue for hours the etherization of the animal, which no longer breathes spontaneously, without the pressure of the blood being notably diminished, and without danger to the life of the animal, which one can always resuscitate by introducing pure air into the lungs.

"It is true, however, that the pressure of the blood always diminishes slightly, so that after two hours it may have fallen, for example, from 120 to 80 millimetres; but such a fall is not prejudicial to life. One is able in these experiments to regulate with facility the quantity of ether, commencing with a low temperature of the vessel that contains it. If one finds that the animal shows a ready tendency to recommence certain automatic respiratory movements, Wolf's bottle, which contains the ether, and is connected with the bellows and manometer by means of India-rubber tubes, is brought rather nearer to the body of the animal so as to increase the heating effect.

"It is otherwise with chloroform. In animals in which, under the influence of this agent, the pressure of the blood has been examined with the manometer, one finds that the pressure is already considerably lowered before automatic respiration has ceased; and we have frequently seen the pulse disappear almost entirely in the manometer, whilst the pressure fell to 25 or 30 millimetres, and the dog still breathed spontaneously.

"In dogs in which one employs artificial respiration from the commencement, causing the air to pass through a bottle containing chloroform, so that in entering the lungs it is but feebly loaded with this agent, we have seen the pressure, sometimes immediately, sometimes after a longer period, lower itself almost to zero, while the extremely weak pulse which the manometer recorded has also ceased soon afterwards, the respiration being continued as at the beginning of the experiment. It is therefore certain that in these cases it was not the cessation of the respiration, nor its weakening, that killed the animal. This becomes yet more evident through the experiments in which, after the cessation

of vascular pressure, when the pressure was that of blood almost at rest, one suddenly replaced the respiration of chloroformized air by normal air without being able to save the animal.

"After a few forced inspirations one sometimes sees the automatic breathing of the animal recommence. This may be up to two, four, and, as in one case, ten automatic inspirations; but the pressure of the blood does not rise, and the dog dies through cessation of circulation.

"Fortunately things do not always go thus. It is possible to find that a very limited quantity of chloroform mixed with the air may maintain a state of apparent death without any automatic respiration, and with an extreme fall of arterial pressure that yet admits, after half an hour's continuance of chloroformization, of the re-establishment of life on pure air being introduced. But the keeping the animal alive in such an experiment is always uncertain: we cannot make sure, as with ether, that the animal will be revived. We are never able to say, and this is a great point, what the limit of chloroform is in the inspired air, which affords us a certainty of the animal being restored."

Prof. Schiff considers that chloroform should be banished from practice as an anæsthetic agent, except in cases in which extraordinary resistance to the effect of ether shows itself, in which instances it might be allowed to mix a little chloroform with it in order to produce the commencement of anæsthesia, which should afterwards be continued with pure ether.

Prof. S. warns surgeons not to continue on operation immediately on a patient's recovery from the excessive action of anæsthetics, but to wait until respiration has been energetically restored, otherwise a new and generally fatal asphyxia may be produced.

14. *Physiological Action of Coca*.—Dr. ALEX. BENNETT states (*Brit. Med. Journ.*, April 18, 1874) that with the aid of Messrs. Macfarlane & Co., chemists, he succeeded in obtaining a small quantity of the crystalline substance cocaine ($C_{16}H_{19}NO_4$). With this he conducted a series of experiments and observations on the lower animals, from which he ascertained that cocaine is a powerful poison with special action on the nervous system. He has also experimented with theine, caffeine, guaranine, and theobromine, with a view of determining the actions of each.

The following are his conclusions:—

1. The physiological actions of coca, tea, coffee, guarana, and cocoa, are mainly, if not entirely, due to their neutral principles.

2. Cocaine, theine, caffeine, guaranine, and theobromine are powerful poisons, inducing a series of symptoms affecting the nervous, respiratory, circulatory, vaso-motor, and glandular systems, which terminate, if the dose be large enough, in death.

3. These five principles are, to all appearances, identical in physiological action.

4. In small doses not ending fatally, these five substances produce—*a*. Cerebral excitement not succeeded by coma, and *b*. Partial loss of sensibility.

5. In large doses they produce—*a*. Cerebral excitement, *b*. Complete paralysis of sensibility, *c*. Tetanic spasms and convulsions, and *d*. Death.

6. They paralyze the entire posterior column of the spinal cord, also the entire system of peripheral sensory nerves; but the anterior columns of the cord and the peripheral motor nerves are not paralyzed.

7. They frequently produce convulsions of a clonic character, but occasionally they cause tetanic spasms, which latter are sometimes so severe as to induce opisthotonos.

8. They do not produce muscular paralysis.

9. They at first increase, then impede, and lastly stop, the respirations.

10. They at first increase, and finally diminish, both the force and frequency of the heart's contractions.

11. They produce at first contraction, and afterwards dilatation, of the capillaries and small bloodvessels, with stasis of the blood, indicating first irritation, and subsequent paralysis, of the vaso-motor nerves.

12. They affect the temperature by first slightly lowering, and secondly increasing it.

13. They usually produce contraction of the pupil.

14. They produce an increase of the salivary secretion.

15. They induce a peculiar form of tenesmus, accompanied by a copious discharge of clear mucus from the bowels.

These conclusions have been arrived at after a careful series of experiments conducted on more than one hundred animals of different kinds; and it is extremely interesting to learn that those agents, which the different nations of the world have found by experience to produce refreshing and stimulating beverages, although unlike one another and procured from totally different sources, possess in common proximate principles, which not only are almost identical in chemical composition, but also appear similar in physiological action.

According to the above observations, cocaine has the same action as theine, etc.; so, for clinical purposes, the latter is at present preferable on account of the enormous expense of the former. That the effects of the beverages themselves are mainly, if not entirely, due to the neutral principles they contain, is highly probable; but of their beneficial action in medical practice I am not yet in a position to give an opinion. However, from their stimulant action and effect on the nervous system generally, there is every reason to hope that the concentrated forms of these drugs, or the neutral principles themselves, will prove powerful and useful agents in the hands of the physician for the treatment of disease.

Before the medical man can practise his profession scientifically, he should be acquainted, not only with the natural course of the malady he proposes to alleviate, but also with the physiological effects of the drug by which he hopes to reach this end. By observations upon the lower animals, he may also obtain suggestions and information which will materially assist him in relieving and benefiting the human being.

15. *Importance of the Purity of Chloral Hydrate.*—Dr. OSCAR LIEBREICH has recently published a paper in the *Berliner Klinische Wochenschrift*, in which he calls attention to the important subject of the purity of chloral hydrate, and the effect which its deterioration may produce on the patients to whom it is administered, and on its reputation as a remedy. The case, he says, is different from that of such a substance as quinia, the adulteration of which will only reduce, but will not pervert, the proper action of the drug. With chloral and other substances prepared by analogous chemical processes, the result of the manufacture may be the formation of compounds which, if administered, produce an altogether different result from that intended. The process of manufacture is one which requires great care; and it seems that it is at least difficult to insure the purity of chloral, if made in large quantities. Liebig himself, who discovered it, never attempted to make more than a few grammes at once; and Dr. Liebreich was so convinced, when he brought it into notice as a medicinal agent, that purity was necessary for success, that the first supplies were made under his immediate superintendence. At present, it is manufactured in various places; and the result is that, in some parts of the continent, notably in Saxony and Switzerland, it has fallen into disrepute. Dr. Liebreich has made a collection of specimens of the drug used in cases where it has failed to produce its proper action, and possesses, he says, some horrible chemical compounds which he would not venture to give to a human being. He prefers the crystallized form of chloral hydrate as the most stable. It may contain hydrochloric acid; this is no disadvantage if the proportion remain the same; but, if it increase, it indicates that the formation of dangerous compounds may be going on. Sometimes the hypnotic action is increased; this he attributes to the production of chlorine compounds, which are more readily changed into chloroform than chloral itself is. An acid reaction, arising from the formation of trichloroacetic acid, does not show that the chloral is unfit for use, though it weakens its action. In pure chloral, this action is limited; while impure chloral is liable to the constantly increasing production of acid compounds—not trichloroacetic acid—of a deleterious nature. Dr. Liebreich remarks that

the German *Pharmacopœia* is in error in fixing the boiling point of chloral hydrate at 95° Cent. (203° Fahr.). This, he says, is correct for anhydrous chloral; but the boiling point of chloral hydrate is not constant.—*Brit. Med. Journ.*, March 21, 1875.

16. *Ergotin as a Means of Arresting Hemorrhage.*—The following results obtained from some accurately recorded experiments on this drug made by Dr. DRASCHE, Chief Physician to the Rudolph Hospital, are communicated by Dr. C. Schwaighofer to the *Irish Hospital Gazette*, May 1.

It was first determined by experiment on animals, that a strong solution of ergotin when brought into contact with an artery, even when the artery was wounded, had the effect of lessening its calibre and so checking hemorrhage.

This at once led to the conjecture, that if the drug were introduced directly into the circulation, and thus brought into actual contact with the walls of the vessels, its action would be more rapid and effectual than if it entered the system through the stomach. It hence follows that the subcutaneous injection is the most effectual way of administering this remedy. As there is no preparation of ergotin in the Austrian *Pharmacopœia*, only an alcoholic extract of the secale cornutum, very similar, however, to the ergotin of Bonjean, the extract was the preparation used in these experiments. Glycerine proved to be the best solvent. Water was found to be not nearly so appropriate, as well from its inferior power as a solvent as because a sediment soon formed in the solution, and the undissolved resinous particles were liable to stop the needle of the injection-syringe and thus greatly increase the mechanical difficulties. Another objection to the watery solution is, that fungus soon forms in it, which at once renders it useless. A solution of 5 grains of ergotin in a drachm of glycerine proved to be the one most suitable for general use. This solution is of a dark brown colour, somewhat translucent, and even after it has stood a considerable time, the amount of sediment deposited is very small. It has another great advantage, viz., that it remains for a long time absolutely free from any fungous growth. A Pravaz's injection syringe, when filled with this solution, contains just a grain of ergotin. The effect of injecting this solution was first tried on several perfectly strong and healthy persons, with the following results: After each injection the number of heart-beats in a minute was lessened by from four to six; a diminution in the size of the arteries was demonstrated by the sphygmograph; the temperature was very slightly elevated, while the respiration remained perfectly undisturbed. The proportion between the amount of fluid imbibed within twenty-four hours and the quantity of urine passed was not affected; the appetite, digestion, and sleep also remained undisturbed. The local effects of the injection deserve notice. Generally, very soon after the injection the skin became reddened; this redness was usually circumscribed, but was sometimes diffused. The time it lasted was variable; in some cases but a very short time, in others for several days, sometimes disappearing for a short time only to return again better marked than ever. In some cases when the redness had disappeared there was left a greenish-yellow discolouration, showing the metamorphosis of the colouring matter of the blood. The redness, if very well marked, was often accompanied by increase of temperature, and pain and tenderness at the point of injection. There was, in some cases, swelling followed by induration, which lasted a considerable time; this happened more especially when the watery solution was used; indeed it was never seen to occur after glycerine. The experiments as to its hæmostatic powers were mostly made on phthisical subjects who had hæmoptysis, either after the usual means, such as ferri sesquichlor., alum, digitalis, plumb. acet., etc., had been tried in vain, or especially in cases where the hæmoptysis began as an actual hemorrhage. However, the ergotin was also tried in cases of epistaxis, hæmatemesis, hemorrhage from the bowels in enteric fever, and especially in scorbutic hemorrhages, and generally with success, even though the improvement was sometimes only transient. In cases of hæmoptysis the quantity of ergotin that was injected was from 1 to 1½ grains; in exceptional cases this was increased to 7 grains (spread over several days) which was the maximum dose. The local inflammation was always propor-

tional to the strength of solution. The injections were always made in the neighbourhood of the greater pectoral muscle. Usually, shortly after the injection, the skin around the puncture became red and tender, with a sensation of burning and often of pain; sometimes there was swelling and persistent induration with greenish-yellow discolouration of the skin. In four very obstinate cases of hemorrhage in advanced phthisis, where cavities had already formed, the hemorrhage was checked after from one to three injections; indeed in one case a single injection proved sufficient. Even in those cases where the hemorrhage was not at once checked it at all events became much less copious, and frequently only remained as a painful expectoration of coagula, which ceased after a few more injections. The rapid effects produced by the subcutaneous injection of the ergotin were all the more striking, as, shortly before, much larger doses of this drug had proved inert when administered by the mouth. In some cases where a copious hemorrhage had its origin in a large cavity, of course we could not expect ergotin to work miracles, and still only in a single such case was its use absolutely without effect. One phthisical young man, who had been attacked every morning for a week with violent epistaxis which had been treated unsuccessfully for four days with ice and perchloride of iron, was completely cured after two one-grain injections of ergotin. In scorbutus, where the cause of the hemorrhage is want of tone and a liability to rupture in the walls of the vessels, ergotin is particularly useful, especially when other remedies have been tried and have failed. These results show that this remedy is in general practical and effective. To the practitioner it cannot but be most comforting in dangerous cases to have at hand a remedy at once so certain and so easily applied, especially where sudden and profuse hemorrhage calls for immediate action, and where, as too often happens, great difficulty is met with in administering internal remedies.

17. *Active Agent of Ergot.*—Dr. A. WERNICH has recently made some investigations in regard to the active principle of ergot in the Berlin Institute. He finds that the watery extract is far more powerful than either the alcoholic or the ethereal extract. The watery extract, when purified by alcohol and ether, forms a mucous or slimy mass which cannot be dried. The active agent appears to be of the nature of an acid soluble in alcohol when pure, but insoluble when in combination with bases.—*Lancet*, April 4, 1874.

18. *Importance of Salts in Food.*—FOSTER (*Zeitschrift für Biologie*, vol. ix. p. 297) has made some interesting experiments on dogs and pigeons, which show that animals die when inorganic salts are altogether absent from their food, although the other nutritive constituents may be abundant. In all animals, a condition of muscular weakness and tremor occurred, which is best designated by the term general exhaustion. The weakness of individual groups of muscles in the dog, and especially those of the posterior extremities, from the second week of the experiment onwards, gradually assumed a paralytic character, such as is observed when the function of the spinal cord is weakened. The activity of the cerebrum was also impaired, as was evident from the increasing bluntness of the senses and the apathy of the animal. Later on, symptoms of increased excitability often appeared. Thus, when the author quickly entered the room where one of the pigeons had ventured upon the cross bar of the cage, it fell suddenly upon the floor of the cage, and there remained crouched in the ordinary stupid position with its eyes closed and its head drawn in. Dogs always cowered at once, as if terrified, whenever any quick motion was made towards them even from a distance. On one occasion, one of them had an attack of madness, springing at the keeper and barking, but crouching down, trembling and growling, when it heard his voice. On being taken out it ran straight forward, and knocked its head violently against a wall in its way. There was tonic contraction of the muscles of the jaw and neck. After the animal has been deprived of salts for some time, the juices of the intestinal canal either lose their digestive power or are not secreted in proper quantity, and nutrition is thus interfered with. Death takes place, however, from the alterations in the nervous system, before there has been time

for it to occur from inanition. The quantity of salts necessary to life is smaller than is generally supposed, but the exact amount required is still to be determined.—*London Med. Record*, May 13, 1874.

MEDICAL PATHOLOGY AND THERAPEUTICS, AND PRACTICAL MEDICINE.

19. *General Angioleucitis of the Lungs*.—Dr. REYNAUD, Physician to Lariboisière Hospital, describes (*L'Union Médicale*, Nos. 35 and 36, March, 1874) two cases of an affection to which he gives the above name, one observed by himself in his own wards, and the other by his colleague, Dr. Féréol, in his wards.

The study of these two cases leads Dr. R. to the following conclusions:—

1. There exists a lesion of the lungs not hitherto described in our classical treatises, and characterized by a vascular turgescence of all the lymphatic vessels, both superficial and deep-seated.

2. This lesion deserves the name of angioleucitis. Although it has some relation to cancer, particularly to cancer of the stomach, we are not justified in denying that general angioleucitis of the lungs may be developed independently of the existence of any cancerous affection. Probably angioleucitis of the lungs may be simple or specific, at the same time presenting great similarity in an anatomico-pathological point of view.

3. This angioleucitis constitutes a grave complication, and may cause death by the lungs in patients affected with primary lesions of other organs.

20. *Dizziness and its connection with Migraine*.—Dr. T. CLIFFORD ALLBUTT states (*Brit. and For. Med.-Chir. Rev.*, April, 1874), "It is most important to be able to assure sufferers from this alarming malady that it is one which is fraught with no more danger to life than a sick headache, for dizziness often comes on in the later life of those who had migraine when younger, comes on, that is, at a time when cerebral symptoms are viewed with growing uneasiness. . . . A distinguished churchman lately complained to me of such a transient vertigo, which would seize him from time to time, not respecting him even when in the pulpit: for a moment he is confused, he makes a strong effort, the giddiness diminishes, and he is safe. Up to middle life he suffered from migraine in the usual form; now he never has it. Compare this with the state of a clergyman whom I once saw, who comes of a highly nervous stock, who had migraine intensely up to middle life and in whom the migraine then gave way to vertigo. He would be seized with irresistible dizziness, which would hurl him off his feet on to the floor, where he would lie for an hour or two dreading removal. The least attempt to raise his head would always bring on an increase of this distressing symptom and a sense of nausea. After a while he would vomit, and all would come right. This case came under my notice about ten years ago, and I understand that the attacks still recur, but in a much less degree. His health is otherwise good.

"I have another patient to whose case the same description would apply. He has been under my occasional care for some years for this kind of vertigo, ending, when severe, in vomiting. Not many weeks ago he was found in the street clinging to a railing, and was brought to my house. There he remained incapable of raising his head until free vomiting occurred, when he obtained his release. This gentleman had suffered greatly from migraine, as a young man, and nearly all his children have been under my care for nervous affections. Now is there any organic connection between the last and the earlier states of another and similar case which I have now under observation. Mr. X—is a nervous man, and for many years had migraine. Then, as he lost the migraine in middle life, he became subject to the vertigo, and had it in a distressing though not in an extreme form. It rarely went on to vomiting, though he was often

obliged to cling to railings and other supports lest he should fall. Some months ago he had this vertigo—for it seemed in all respects the same—in a terribly aggravated form. He remained so confused that for several days he could not raise his head from his pillow, and he vomited repeatedly but without much relief. Consciousness was never affected. As he became more able to move about, he found that the right hand was ataxic, and his articulation was also struck with ataxy. His right hand, though not weakened, was incapable of precise function; and although he never used wrong words his utterance was clipped and unrhythmical. Four or five months have elapsed since his seizure, and he has slowly improved; yet the defects are far from being obliterated, and I fear he is a stricken man. If this seizure was hemorrhagic it was strangely like his preceding attacks, which were undoubtedly migrainous.”

21. *Albuminuria in Cases of Vascular Bronchocele and Exophthalmos.*—Dr. J. WARBURTON BEGGIE, in an interesting article in the *Edinburgh Med. Journal* for April last, points out the occurrence of albuminuria during and after digestion in cases of vascular bronchocele and exophthalmos. This albuminuria he says is evidently temporary and unconnected with any form of renal degeneration. He has never seen so large an amount of albumen in the urine in any other disease when the case of the albuminuria was not inflammatory or organic. In some cases it was an evanescent symptom lasting only for a short time, and when so, only present in limited degree. In others, the albuminuria has been very considerable—it has even been excessive, and it has lasted for weeks, indeed for months—while the other notable symptoms of the complex malady continued, and only disappeared as the latter became relieved or removed. Œdema of the lower limbs, although in the first instance calling attention to the condition of the urine, has not been observed to bear any constant relation to the albuminuria; on the contrary, œdema, and sometimes considerable anasarca of the legs, have been present without any appearance of albumen in the urine; and albumen, when present, has generally existed without any form of dropsical swelling. In the most notable cases of albuminuria in connection with vascular bronchocele and exophthalmos, dropsy has not been present.

In prosecuting my inquiry on this subject, a very interesting circumstance became manifest, namely, that the albuminuria was in certain cases limited to the period of digestion—present immediately after a meal, and absent when the person fasted. I had in one case been not a little puzzled by noticing the strange variety presented by the urine within very short periods—the albumen present in considerable quantity one day, and absent the next—present in the urine of the forenoon, and not to be detected in that passed before dinner. By obtaining repeatedly specimens of the urine in this case, and in one or two others, I was able to satisfy myself that in this disease the albuminuria is apt to possess the remarkable character of only occurring during or immediately after the digestion of the food.

In addition to the intermittent character of the coagulability, in the cases seen by Dr. B., the quantity and density of colour of the urine did not deviate from the healthy standard, and still further diligent and repeated examination by the microscope failed to detect the vestige of a cast of any kind—these are to be regarded as proofs of the renal disease being functional and not organic.

22. *Œsophagismus or Spasmodic Closure of the Œsophagus.*—Dr. A. W. FOOT read before the Medical Society of the College of Physicians, Ireland, a description of four cases of this peculiar and not very common affection, which had been under his care in the Meath Hospital. Three of the cases occurred in man, and one in a female. In none was there any evidence of organic disease or of hysteria; and none of them were cases of what Sir Henry Marsh had termed the regurgitating disease. Dr. Foot described, *seriatim*, the symptoms in each case, which so far resembled one another in character: (1) In suddenness of occurrence; (2) In there being a more or less intermitting dysphagia, which was greater with solids than with fluids, and more likely to be excited

by cold fluids than by hot, as also by anything sour; (3) In the occurrence of œsophageal vomiting; and (4) in the co-existence of hiccough as a symptom. In two of the cases there was no cause assigned for the occurrence of the complaint, in the third it was attributed to a squeeze of the throat, in the fourth to intense grief. The whole four occurred in persons of the disposition called "nervous;" but there was no reason to believe that their symptoms were either feigned or exaggerated, or in any way under their control. The dysphagia was certainly œsophageal, not pharyngeal, and therefore beyond the influence of the will. The diagnosis of œsophagismus was, Dr. Foot observed, based upon the suddenness of its occurrence, the variability of its intensity with various kinds of food, its intermittence, the co-existence of other symptoms, especially hiccough, and the absence of other causes of dysphagia—mechanical, inflammatory, or paralytic. The œsophageal vomiting in these cases is manifestly different from gastric vomiting, in the absence of nausea and of contraction of the muscles of the stomach or abdomen, nor has the returned food any sour or acid taste. In conclusion, Dr. Foot referred to Dr. Graves' remarks on a "curious affection of the organs of deglutition,"¹ and to Sir H. Marsh's papers on "a peculiar morbid affection of the stomach, characterized by regurgitation of its contents without nausea,"² and remarked that cases of regurgitation appear to be more common in young females, and œsophagismus in young males.

The Chairman said that his father had had an attack of spasm of œsophagus: and that for an entire week he was unable to swallow either fluids or solids. There was no fever. The idea of death from starvation in the midst of plenty was before him, when suddenly, without any special treatment that he (the Chairman) could remember, the power of deglutition returned.

Dr. Atthill said that these cases do not prove fatal; and as showing the difficulty of deglutition that is caused by some kinds of foods more than by others, related the case of a boy, aged 12, who was under his observation, and who was unable to swallow meat, or food which required mastication.

Dr. MacSwiney could recall three cases which corresponded with the description Dr. Foot had given of the affection. They were all in men between the ages of 18 and 30, and all recovered. In one of these cases there was an enormous secretion of mucus; and frequently a morsel of food which had been swallowed one day, would be ejected unaltered, and recognized twenty-four or thirty hours subsequently. In this case there was also an enormous dilatation of the œsophagus above the seat of spasm; warm liquids alone could be swallowed. Passing a probang gave great relief. Dr. MacSwiney was led to believe that there was sanguineous congestion of the œsophageal mucous membrane, from the fact that in one of his cases blood was brought up at intervals in small quantities. Antispasmodics alone seemed to give relief in these cases, and hydrocyanic acid, especially, was *the* remedy.

Dr. H. Kennedy has seen five or six cases of this kind: all recovered. Sometimes there was a total stoppage, and other cases seemed to be able to get down a little. One of his cases had been attended with much pain. The administration of nitrate of silver in quarter-grain doses, in solution, had been particularly useful in one case. Dr. Kennedy, if he had another case, would recommend warm baths, and nitrate of silver, internally, combined with opium. He thought the disease was something of a similar kind to that affecting other parts of the body, *e.g.*, the urethra, bowels, etc. Dr. Kennedy also referred to the case of a medical man who could not swallow when in company.

Dr. W. G. Smith related the history of a case that has been under his observation for seven years. The patient had cholera in 1866. During convalescence from it he had, for the first time, an attack of spasm of the œsophagus, and could get no fluid or solid into the stomach. The food regurgitated from the œsophagus in a few moments. He had pain under left scapula, hiccough, and a copious secretion of saliva—amounting on some occasions to four cupsful

¹ Dub. Med. Journal, iii., 167.

² Dub. Med. Journal, xxiii., 437: and Dub. Quart. Journal Medical Science, xvi., 681.

a day—took place. The spasms occur intermittingly. On one occasion an attack lasted 100 hours. Dr. Smith had twice observed that after attempting to swallow milk during a spasm, a conical cast of curd, the diameter of the œsophagus, was thrown up. There was no evidence of hysteria or of organic disease. The effect of treatment was most capricious. On one occasion, during a spasm, Dr. Smith injected gr. $\frac{1}{8}$ of apomorphia. In five minutes afterwards the patient was nauseated, and vomiting and purging followed, but the spasm subsequently returned. Bearing out the remarks of Dr. Atthill, this patient was peculiarly liable to a spasm when he swallowed meat. He was not so subject to the attacks now as he has been.—*Irish Hospital Gazette*, April 1, 1874.

23. *Extension of Melano-sarcoma by Embolism.*—Prof. EBORTH, of Zurich, records an interesting case showing how the extension of tumours to distant parts may occur. The eyeball was extirpated for melano-sarcoma originating apparently in the choroid. After 19 months, signs of tumour in the liver appeared, followed by rapid emaciation and death in other two months. There was found after death extensive melanoid sarcoma of the liver, and in addition melanoid and other cells were observed in the bloodvessels of the kidney and spleen. There was evidently here a passage of the solid elements of the tumour into the blood, and a direct infection of distant parts by these elements. This observation may be important as indicating how tumours may spread. In this case the cells were pigmented so that they could be readily recognized, and we must suppose that in other cases where their recognition is not so easy, a similar transportation and spread of the tumour by embolism takes place.—*Glasgow Med. Journ.*, Jan. 1874, from *Virchow's Archiv* for July, 1873.

24. *Paralysis of the Radial Nerve caused by an unusual mode of Lead-Poisoning.*—Dr. ALTHAUS read before the Clinical Society of London (April 25th, 1874), notes of the case of a chemist who was laid up for four months with erysipelas. Some time after, he lost the use of the muscles supplied by the radial nerve, so that he was unable to use his hand and fingers. The author found, by using electrical tests, that the paralysis must be owing to the influence of lead. There are three different forms of paralysis of the radial nerve—viz., one caused by injury, a second by the influence of wet and cold, and a third by saturnine poisoning; and these may be distinguished from each other by the following signs. In *rheumatic paralysis*, the farado-muscular excitability is generally normal; there is no, or only a slight degree of, anæsthesia of the skin; and the supinator muscles suffer just as much as the extensors. In *traumatic paralysis*, the farado-muscular excitability is lost; there is anæsthesia of the skin; and the supinators suffer equally with the extensors. Finally, in *saturnine paralysis*, farado-muscular excitability is lost; there is no anæsthesia of the skin; and the supinators are perfectly healthy. This last group of symptoms being present, search was made for a source of lead poisoning; and it was at last found out that the patient had used an ounce of the unguentum plumbi subacetatis compositum as a dressing for the sore on his thigh three times daily for a month. Lead is absorbed even by a surface not denuded of its cuticle; but its absorption was in this case considerably facilitated by the highly vascular condition of the sore, and the length of time during which the lead ointment, which was spread on lint, remained on the surface of the wound. Iodide of potassium was given for three weeks without relief, but three applications of the continuous current completely restored the use of the limb. Dr. Althaus concluded his paper with some remarks on absorption of lead in general, and on the seat of the paralyzing lesion in cases of lead-palsy, showing that the loss of power is not owing to an affection of the nervous centres or the muscles, but of the peripheral nerve-trunks. He recommended to resort early to treatment by the continuous current in these cases; as, in the latter stages of the complaint, when muscular atrophy and contraction of the antagonists has set in, the effect of the same treatment is much more slow, and not nearly as complete, as in the earlier stages of the affection.—Mr. LEE

related the case of a young woman, who gradually declined in health, had loss of tone, etc., and whose ailment was traced to her occupation of shaking out cloths in a room full of dust, lead being found in the dust.—*Brit. Med. Journ.*, May 16, 1874.

25. *The Local Treatment of Lung Cavities.*—Prof. W. MOSLER, of Griefswald (*Berlin Klin. Wochenschrift*, October 27, 1873, translated in *The Clinic*, December 13, 1873), made the attempt last year to introduce remedies into the lung cavities from the outside, through the walls of the thorax, and gives the following account of his experience:—

My first attempt was in a case of phthisis in the last stage of the disease. I did not expect either cure or improvement. I only wished to demonstrate the possibility of the method. It was the case of a labourer, æt. 51, affected with right-sided pneumonia since 1869. He had had several attacks of hæmoptysis, and had become emaciated in extreme degree. In the right apex and in front was a superficial cavity reaching down to the fourth rib and of easy demonstration.

On November 1, 1872, I pushed through the thorax wall, second intercostal space, 6 ctm. from the right border of the sternum, a tolerably large canula of the well-known aspiration syringe of Thiersh. I then injected through this canula 20 ccm. of a dilute solution of the permanganate of potash. The syringe was then unscrewed from the canula, which was permitted to remain, and on three following days the injection of the same quantity was repeated. On the fourth day the canula became occluded and was removed. *The patient suffered, meanwhile, not the least inconvenience.* I was encouraged, thus, to further experiments.

In February, 1873, I repeated this experiment in a case of left-sided bronchiectatic cavity whose secretion had assumed a fetid, putrid character. After five injections, which were borne without difficulty, the secretion had changed for the better and the general condition had materially improved. I considered myself justified, then, in repeating this experiment in another way, *in order to give the secretion free exit and escape.*

In the case of a painter, æt. 49, who had been treated in my clinic for five years for a bronchiectatic cavity of the right upper lobe, who had had several attacks of hæmoptysis, suffered often with fever, had become extremely emaciated, and, besides all this, had amyloid degeneration of the kidney, as shown by an abundant deposit of albumen in his urine, I made an opening, July 2, 1873, assisted by my colleague Prof. Hüter, into the very superficial cavity, in the following way:—

A long incision (3 ctm.) dividing the skin and superficial intercostal muscles, commencing about $5\frac{1}{2}$ ctm. from the right border of the sternum, was made along the upper border of the third rib. The long duration of the affection pre-implied a firm adhesion between the two layers of the pleura, so after dilatation of the incision through the muscle, the wall of the cavity was gradually opened with a suitable pair of forceps, penetrating more and more deeply into the bottom of the wound. A whistling sound in inspiration and the escape of a purulent secretion mingled with air bubbles furnished the certain proof that the cavity had been opened. No hemorrhage occurred. After the opening into the cavity had been somewhat dilated, a pretty large silver drainage tube was introduced into the cavity and fastened with plaster to the wall of the chest. Pledgets of carbolized lint and an ice bladder were then applied. The patient endured the operation very well.

On the evening of the same day the temperature was 37.8° C. the pulse 84, respirations 36. General condition good. *Pus flowed through the canula abundantly, particularly in coughing.* The bandage had to be renewed several times during the day. *Cough and secretion were both less.*

On July 12, a hæmoptysis occurred, perhaps as the result of granulation formation in the cavity. A dilute solution of liquor ferri sesquichlorati was blown through the canula, whereupon the hemorrhage soon ceased.

Subsequently, a dilute solution of carbolic acid and tincture of iodine was

brought into the cavity, twice daily, by the same *pulverisateur*. He declared that he felt it enter the cavity.

Injections of larger quantities of a solution of permanganate of potash by means of Esmarch's irrigator were not borne so well. A sense of tightness followed and febrile excitation. I desisted from their use thereupon and continued the use of the atomized fluid, satisfied that a sufficient quantity entered the cavity through the canula on deep ins- and expiration.

The pus had now assumed a laudable character and was less profuse. There could be no doubt that this disinfection had a better result than the inhalation of carbolic acid by the mouth.

Percussion showed a more marked cracked-pot sound than before, probably in consequence of the external opening. The rales, however, were less intense. The patient had no especial complaints to make as to any trouble in the lungs. His condition was better after than before the operation. The process in the lungs, moreover, seemed to have made no essential advance. There was, however, no improvement in the general status, as was expected there should be, at the start. The albumen in the urine increased, and the general strength reduced so that he was confined to bed.

On my return to Griefswald, Oct. 1, the condition of the patient had so far changed for the worse that he continued to lose strength in spite of nourishment and stimulation, and albumen continued to increase in the urine. Emaciation was very marked, appetite and stool normal. Fever had not persisted. The temperature had never risen above 37.6°C. , morning or evening. There was but very little cough and expectoration. Pus continued to flow freely through the canula, however, on which account I continued the insufflation through the canula of dilute carbolic acid twice daily. Physical examination revealed no essential change. The process in the lungs had not advanced. Respiratory difficulties had been hitherto but little marked, occasionally there was a distressing fulness and sense of pressure in the epigastrium.

On Oct. 3, his condition became markedly worse. The heart's action was much reduced, indications of collapse set in. The temperature fell to 36.6°C. , the pulse was barely perceptible, and there was complaint of dyspnoea. Stimulants effected no improvement. On the next day over the whole left lung there could be heard fine rales which increased in intensity. He died with manifestations of cardiac paralysis, on Oct. 5, at $7\frac{1}{2}$ P. M.

The *post-mortem* revealed an extremely emaciated body, subcutaneous and muscular tissues markedly atrophic. After opening the thorax, the left lung retracted well; *the layers of the right pleura were perfectly adherent.* The left lung firmly adhered at the apex, less in the region of the posterior section of the lower lobes. On section, the upper as well as the lower lobes seemed vascular, their substance containing in small numbers, partly in discreet form, partly in small circular groups, grayish-white nodules. The mucous membrane of the bronchi was slightly injected, else normal. *The right lung in its whole extent, most markedly from the third rib upwards, was solidly adherent to the pleura costalis.* After removal it showed from its apex to the border of the lower lobe, a whitish pseudo-membrane of several lines thickness and of almost cartilaginous consistence. *At the lower lobe is a canal running obliquely from before and below, backwards and upwards, with smooth walls, and of the diameter of the canula above described.* This canal leads to a cavity which takes up the greatest part of the upper lobe. The cavity is filled with yellowish purulent fluid. The inner wall of the cavity is marked by projecting prominences differing in their reddish colour from other parts of the wall of the cavity, which have a grayish-black colour and smooth surface. The prominences show distinctly in places a *feebly granulated surface*. A watery reddish tinged fluid exudes on pressure from the cut surface of the lower lobe. Here, too, are to be seen in very small numbers discreet or grouped grayish nodules, of the size of a barleycorn.

I believe I am justified in one statement as a certain conclusion from these experiments, viz., *that the local treatment of lung cavities can be effected.*

As is well known, such a proposition was made by Barry in 1726, and renewed

later by Masse, v. Herff, Hooken¹ without, however, any practical results. Numerous objections were urged, in regard to the difficulty of diagnosis and successful accomplishment of the operation. The great advances of modern medicine and surgery, in great measure, remove these fears.

As to the final conclusion concerning the value of this operation, opinions will differ. Probably the conclusion will be the establishment of different indications. The cases communicated show that the operation has value as a symptomatic method of treatment. The condition of the last patient was better after than before the opening. The cough was less distressing after means of escape was offered to the pus. And in consequence of the disinfection of the cavities, the *fever was less*.

There can be no doubt that my experiments have proven one fact, viz., that the lung is more tolerant of external manipulation, that these external attacks are less dangerous and more easily executed than has been heretofore believed.

Dr. WM. PEPPER, unaware of these observations, treated (*Philadelphia Medical Times*, March 14, 1874) three cases, in February, 1874, by injections through the chest-wall, and remarks that it is probable that this mode of treatment will find one of its most successful fields of application in chronic non-tuberculous cavities in the lungs, in cases where the remaining lung-tissue has not become the seat of secondary tuberculous formations. It is of course uncertain how much curative action we may be able to exert in such cases by any local application made through a canula. In the only case I have reported where the treatment has been continued long enough to produce any decided action, it is unquestionable that a certain degree of positive improvement has occurred both in general symptoms and local signs. And I am encouraged to hope that, with further experience, definite modes of treatment may be formulated which will prove of material benefit in this hopeless class of cases.

Further, I cannot see why, if it be not injurious to pass a delicate needle through the infiltrated wall of a cavity, we may not introduce it into the centre of superficial circumscribed indurations or caseous infiltrations of the lung-tissue, and make such injections as may tend to induce absorption or reparative action. Finally, it appears to me that we have in this mode of making local applications to the lung-tissue, a valuable means of treating some cases of severe hæmoptysis, especially when the hemorrhage proceeds from a well-defined seat of disease.

In regard to the mode of making the puncture, I have hitherto employed the finest (No. 1) of the needles accompanying Dieulafoy's aspirator, and have used it with the "previous vacuum" attached. For the first exploratory diagnostic puncture it is probably desirable to employ an aspirator, as it would also be if it were desired to empty such cavities before injecting them. But for the continuance of the treatment it will perhaps be quite as well to use a capillary canula, with trocar which can be withdrawn, so that a syringe can be fitted to the canula and the injection made. I have employed local anæsthesia by freezing, and have directed the patients to take a full breath and to hold it before the puncture was made.

The only fluid which I have as yet injected has been dilute Lugol's solution (Miv to f3j), of which from four to ten minims have been injected. The entire absence of signs of irritation makes me confident that a larger quantity could be introduced without injury. This substance appeared suitable for the cases in which I have thus far operated. It is probable that other solutions, astringent or antiseptic, may be found preferable in some cases. In cases of local consolidations, solutions of iodine might also be expected to prove most beneficial.

I design employing a dilute solution of Monsel's salt for injection in suitable cases of serious hæmoptysis.

The practical value of this mode of treating pulmonary diseases is as yet un-

¹ C. Canstatt's *Specielle Pathologie und Therapie vom klinischen Standpunkte* aus bearbeitet. Supplement to 1 and 2 ed., by Dr. E. H. Hensch, Erlangen, 1854. Notwithstanding numerous efforts I have not succeeded in obtaining the original papers of these authors.

certain. But it has appeared to me that, considering the almost hopeless nature of some of these lesions, the proof that a puncture may be made into the lung-tissue and remedial agents brought into direct contact with the seat of disease without any serious danger, calls for a patient trial of it.

Dr. JAMES H. HUTCHINSON (*Phil. Med. Times*, May 30, 1874) cites a number of authors to prove that the above suggestions are not novel, and believes that the operation is not one which is likely to result in good to the patient. In the first place, the presumption in regard to its usefulness is against an operation which, after having enjoyed a brief popularity during at least three or four different periods, has been so utterly forgotten that it has been as many times proposed as entirely new, and is certainly against one in which the opportunities for performing it would be so frequent as they are in this. The quotations which we have introduced above demonstrate with sufficient clearness that the lung may in many instances be laid bare and punctured without apparent injury to the patient. We are inclined to think that this is by no means uniformly the case. In one of the cases reported by Dr. Pepper a slight hemorrhage followed the introduction of the aspirator; and the same accident occurred in the operations done by Dr. Mosler and Dr. Hastings. We are, moreover, very strongly convinced of the fallacy of the argument that, because punctured wounds of the lungs in healthy individuals generally do well, their infliction upon consumptives is not likely to be followed by bad results. Niemeyer—we believe (for we quote him at second hand)—goes so far as to say that the inflammation excited by wounds of the lungs usually terminates in phthisis; but, admitting that this distinguished physician may push his conclusions as to the nature and origin of this disease to an unwarrantable length, there are certain differences in the anatomy of the lung in health and disease which ought not to be overlooked. Caseous degeneration is not the only change which is observed in phthisis. There is in addition to this, in most cases, a development of connective tissue, the effect of which will be to enlarge and keep open the wound made by the aspirator or trocar, and thus to allow the escape of the contents of the cavity into the pleural sac whenever this is not prevented by firm adhesion; and that cavities are not always protected by adhesions is shown by the occasional occurrence of pneumo-thorax from their rupture. Moreover, the opinion that injections may be of service in the treatment of phthisis rests, we think, upon a mistaken therapeutic basis. In certain conditions of the serous membranes these are unquestionably useful by exciting inflammation; but a little reflection will convince any one who has abandoned in whole or in part the theory which makes phthisis the result of tubercular deposit that this is the very last thing to be desired in this disease. The object aimed at in the management of phthisis, and especially in those local cases in which Dr. Pepper thinks the injections are most likely to be useful, is to allay inflammatory action, not to excite it. We therefore are unable to see how they can be productive of any good; on the contrary, if they light up an inflammatory process in the walls of the cavity, this will be very likely to extend to the circumjacent tissue, and thus the disease, which may have been previously held in abeyance, be roused into activity.

In conclusion, we have only to add that we never condemn a plan of treatment on purely theoretical grounds, and will gladly adopt the one under consideration if the result of further experiments shall convince us of the incorrectness of the unfavourable opinion we have formed of it. In the mean time, however, we shall remain in full accord with Dr. Hughes Bennett,¹ who thinks that the result of all operative interference in phthisis has been "what an intelligent consideration of the pathology of the disease might have anticipated—a uniform failure."

26. *Employment of Bromide of Potassium as an Auxiliary in the Treatment of Intermittent Fevers.*—Dr. VALLIN does not question the general efficacy of quinia in the treatment of intermittent fevers, but he observes that there are some rare cases where, in spite of the judicious and prolonged use of this alkali-

¹ Reynold's System of Medicine, vol. iii. p. 589.

loid, the malady continues, and in such circumstances the bromide of potassium appears to be beneficial as a subordinate agent. A case seen by Dr. Vallin in the hospital of Batna, in Algeria, first drew his attention to the subject. A patient suffering from ague had been treated in vain by the sulphate of quinia, given by the mouth, in injections, and hypodermically; notwithstanding these and other similar measures the disease returned every morning at the same time and with great and extraordinary violence. Dr. Vallin was therefore induced to ask himself whether in such a case there was not an unusual complication of disorder of the nervous system together with the ordinary paludal cachexia, and hence he thought of employing the bromide of potassium, which appears to have the power of allaying spinal irritation, and is therefore used in epileptic and other kindred affections. At the end of three days after employing the bromide the fever disappeared for the first time for three weeks and did not reappear for a week. In six other cases he employed the same remedy, with results somewhat different, but generally satisfactory. He thinks that the bromide probably acts less against the periodicity of the fever than against some concomitant disorder of the cerebro-spinal functions; that perhaps an exaggerated sensibility of the spinal cord or some nervous exhaustion may favour the return of the paroxysms; and that the bromide may in such cases, by calming the nervous excitement, assist the action of the quinia. Whatever may be the explanation, the results were satisfactory in several cases which are recorded by Dr. Vallin; four were instances where the treatment was certainly beneficial, but in two others the results were doubtful, and in three more the treatment failed altogether. In an additional case mentioned, a ward attendant, who had suffered previously from attacks of fever, and subsequently had an attack of neuralgia which resisted quinia and hypodermic injections of morphia, was relieved most materially by the use of the bromide of potassium in large doses, which not only seemed to cut short some of the paroxysms, but to render others more supportable, and to allow the renewed use of the sulphate of quinia and thus complete the cure.—*Brit. and For. Med.-Chir. Rev.*, April, 1874, from *Bull. Gén. de Thérap.*, Nov. 30, 1873.

27. *Carbolic Acid in Intermittent Fever.*—Surgeon McNALLY states (*Indian Med. Gaz.*, April 1, 1874) that he made trial of carbolic acid in the treatment of uncomplicated intermittent fever during an extensive prevalence of this disease in the 3d Regiment, at Secunderabad. "These trials," he says, "prove at least that carbolic acid is much inferior to any of the other remedies employed. It is now my belief that this medicine is of *no value whatever in the treatment of intermittent fever*, and that the patients would have got well as soon with the usual aid of a purgative, rest, and a blanket. In some cases (not recorded) a few doses of quinia or of quinidia were sufficient for cure after the marked failure of carbolic acid. I am not in a position to speak positively with regard to the reputed diaphoretic action of carbolic acid, but I think it is very doubtful. Abundant diaphoresis certainly did occur in the patients who were taking it, but also occurred in the patients who were not. Irritability of stomach was a common accompaniment of the fever which prevailed in this corps during the past year; and, contrary to what might be expected, carbolic acid did not seem to alleviate it in any case. These observations are, I think, sufficient to establish that carbolic acid cannot be relied upon in the general treatment of ague, and that its value in any case is, to say the least, exceedingly problematical."

28. *Hypodermic Injection of Carbolic Acid in Erysipelas.*—Dr. AUFRECHT, of Magdeburg, having last year lost four patients of advanced age who were attacked by erysipelas of the extremities after injury, determined to try the effect of carbolic acid, and in a short paper in the *Centralblatt* for February 21, he communicates the results which he obtained in two cases. If (he observes) it be true that erysipelas in such cases as these arises from the penetration of organisms into the subcutaneous tissue, and their multiplication there, and if carbolic acid possess the power of destroying such organisms or of impeding their injurious influence, this substance should be able to prevent the

spreading of the erysipelas, and to a certain extent diminish its danger. In order to ascertain whether carbolic acid may be hypodermically employed without any ill consequence, he experimented upon himself with a 1 per cent. solution, of which he threw in six decigrammes at a time—*i. e.*, the amount contained in an ordinary Pravaz's syringe. Neither local nor general ill-effect resulted. Since then he has employed the injection in two cases—the one a woman aged fifty-six, with erysipelas of the forearm and the hand, arising from a slight abrasion; and the other a man, aged eighty-two, with erysipelas of the thigh following slight ulceration of a cicatrix. In the first case five injections were employed during three successive days, and in the second four injections within two days. The injections were thrown into the sound subcutaneous tissue just beyond the margin of the erysipelas as it advanced towards the trunk. Its progress was at once arrested in the direction where the injections were made, the injection being repeated in consequence of some insular erysipelas appearing beyond the first injection-points. More remarkable still than this limitation of the erysipelas was the decided influence of the injections in diminishing the febrile action and the frequency of the pulse, and in inducing a general improvement in the patients' condition. Convalescence was quite satisfactory in both patients.—*Med. Times and Gaz.*, March 28, 1874.

29. *Guarana in Chronic Rheumatism*.—Mr. E. A. RAWSON states (*Irish Hosp. Gaz.*, April 15th, 1874) that when suffering severely from lumbago, and other remedies failing, he tried guarana as an experiment. He took 15 grs. in hot water, with cream and sugar, and experienced entire relief from pain for 24 hours. When the lumbago returned he took another dose with the same result. "I gradually," he says, "increased the dose to 40 grs., and took it regularly, once a day, for about a week. The lumbago disappeared. I gave up the guarana, and in a few days the pain in the back returned. A 40 gr. dose removed it, and it did not return for several days afterwards. Now, whenever it does, I have my remedy at hand. During the last month I have experimented largely with guarana on a variety of patients, rich and poor. The results vary. When the pain is acute, coming on with sharp stings, guarana acts like magic; when it is of a dull, aching character, the drug is slower in its action, and several doses must be taken before any decided benefit can be perceived.

"I have come to the following conclusion, viz., that whenever the fibrous envelopes of nerves, the aponeurotic sheath of muscles, the fasciæ or tendons are the parts affected, guarana gives, if not instantaneous, at least very immediate relief, which will last from twelve to twenty-four hours; and I confidently expect that perseverance in the use of the drug, gradually increasing the dose up to 40 grs., will entirely remove any of the above mentioned kinds of rheumatism.

"Of the good effects of guarana on nervous hemicrania there is no doubt; and I trust it will prove, in other hands, as valuable against rheumatism as it has in mine."

30. *Gelsemium in Odontalgia and Facial Neuralgia*.—Dr. J. SAWYER, of London, and Dr. E. MACKEY, of Birmingham, extol (*Brit. Med. Journ.*, May 2) the efficacy of tincture of gelsemium, made from two ounces of coarsely powdered gelsemium root macerated in a pint of rectified spirit, for the relief of odontalgia and facial neuralgia. The dose is from five to twenty drops every six hours. Dr. Sawyer says that out of about twenty cases the use of the remedy has not failed to give decided and lasting relief in more than three or four.

31. *Internal Use of Sulphate of Atropia for Profuse Sweating*.—Dr. FRANTZEL has tested the power of sulphate of atropia in checking profuse sweating in 75 cases in the Charité in Berlin, and is very well satisfied with the results obtained. He gives $\frac{1}{16}$ th of a grain in pill, and in only four cases was he required to discontinue it on account of diarrhoea. He uses it not only in the sweating of phthisis but also in that of other diseases, such as acute rheumatism, or convalescence from trichiniasis. The author supposes that it

acts by constricting the small arteries which supply blood to the sweat-glands, the sweating being probably due to relaxation of these arteries. Several observers have shown that atropia produces marked narrowing of small arteries. The dryness of the throat and mouth, and the parchment-like dryness of the skin in the advanced stage of atropia poisoning, are also probably due to constriction of the small arteries.—*Glasgow Med. Journ.*, Jan. 1874, from *Virchow's Archiv*, July, 1873.

32. *Treatment of Eczema, Lupus, and Cancer by Gurjon Oil.*—Prof. ERASMUS WILSON, in a communication made to the Medical Society of London, April 13th, stated that he had used a liniment composed of equal parts of the gurjon oil and lime-water in cases of painful eczema, in lupus, and in cancer, with very encouraging results; and stated that Mr. Hancock had applied it in a case of cancer of the skin with the effect of dispersing tubercles and healing ulceration; but its most useful property was that of relieving pain. Mr. Wilson suggested that this very simple remedy deserved a trial at the hands of the profession, and believed that it would be found a valuable agent of cure in many affections where the skin was painfully attacked.—*Lancet*, May 16, 1874.

33. *Treatment of Leprosy by Gurjon Oil.*—The Nos. of *The Indian Medical Gazette* for February and March of the present year contain a very interesting report on this subject by Surgeon-Major J. DOUGALL, M.D. When stationed at Port Blair, India, Dr. D. became deeply interested for the wretched condition of the patients suffering there from leprosy, and finding the existing mode of treating the disease inefficacious, he determined to try the oleo-resinous substance—known in commerce as gurjon oil—obtained in abundance from the *Dipterocarpus laevis* and other trees of allied genera. He tried this oil in various combinations, and he decided that the best mode of using it externally was in the form of an ointment made by violently agitating together three parts of lime-water with one part of gurjon oil until it becomes of the consistency of soft butter. He also used it internally in a thinner mixture composed of equal parts of lime-water and gurjon oil.

The following was the treatment adopted: The patients were made early every morning to wash themselves in a small stream using finely pulverized dry earth as a detergent. They were then given half an ounce of the lime-water and oil mixture internally, and obliged to rub themselves all over for two hours with the ointment. Another dose of the mixture was given in the afternoon, and the rubbing with the ointment repeated.

"Of the 24 cases under treatment here during the past six months," says Dr. D., "every one of them has decidedly benefited by its use, every ulcer without exception has healed up, and not broken out again, but the most marked benefit has been derived by those suffering from the anæsthetic form of the disease.

"The first notable improvement was in relation to the leprous ulcers, which began to heal, and at the same time, anæsthesia gradually diminished."

"The change the tubercles undergo in the process of reduction is worthy of notice. After the lapse of some time the tubercle seems to become more movable and loose at the base, and it is felt to be softer there than at the apex. This softening process gradually approaches the surface, and at last a watery bleb forms, and this bleb soon bursts and allows a thin serous clear fluid to escape, and a marked diminution is then observed as regards the size of the tubercle as compared with its former dimensions. This may take place two or three times until the tubercle is quite reduced. I found it expedited matters very much to puncture these watery vesicles with the point of a lancet, and it allowed the fluid to escape without pain or inconvenience to the patient, and did not interfere with the rubbing process. I have seen a tubercle on the helix of the ear entirely subside after one formation of the vesicle.

"The gurjon ointment, though thoroughly rubbed on the surface of the body for four hours every day, produced no vesications directly from its action, and

causes no pain whatever; it seems to be, through its constitutional effects, that the tubercles soften from within outwards. I have rubbed it over my own arm, and it did not cause the slightest pain or redness though allowed to remain on all night.

"The emulsion, as I have already explained, is not disagreeable to the palate, and at first it had no well-marked influence upon the digestive system, but when the dose was increased to one drachm twice a day it improved the appetite, and at the same time acted as a mild laxative.

"It also had a distinct diuretic effect, and the larger doses (four drachms) twice a day caused several large healthy motions, in fact acted as a powerful diuretic and evacuant."

Limited as has been the duration of this mode of treatment, it has been long enough, Dr. D. says, to show "that leprosy, both tubercular and anæsthetic, can not only be arrested, but the condition of the lepers can be greatly ameliorated, and men here, who had not for years been able to do more than drag out a miserable helpless existence, are now able and willing to work, and every sore is quite healed. In some instances the sores have been healed up for more than three months, and show no tendency to re-open, and these desirable results have been attained simply by the use of gurjon oil and lime-water, substances which are so cheap as to be within the reach of all. No change whatever has been made even in the most minute particular in regard to the diet of the lepers, from what they have been getting for years past, and they get their fish four times a week as usual. I always thought, and still consider, the men under-fed; still I made no change, in order to avoid complications, and to test the gurjon oil on its merits."

SURGICAL PATHOLOGY AND THERAPEUTICS AND OPERATIVE SURGERY.

34. *Intravenous Injection of Chloral into the Veins for the Production of Anæsthesia in Surgical Operations and also for the cure of Tetanus.*—Prof. ORE of Bordeaux communicated to the Academy of Sciences, March 2d, a case in which he induced anæsthesia, in a patient on whom he had occasion to excise the calcaneum for necrosis, by the injection of chloral into the veins. One of the radial veins was opened by a capillary trocar, and a solution of chloral, ten grammes to thirty of water, was slowly introduced, and when twelve grammes of the solution had been thrown in, the patient, whose respiration continued perfectly regular, declared that he felt quite overcome with the desire to sleep. However, the injection was slowly continued until twenty-two grammes had entered the vein, and the desire to sleep had become quite irresistible, the patient resembling a corpse in appearance. Not less than ten minutes were required to produce this result. The operation was now proceeded with, and lasted twenty-five minutes. During the whole time the patient continued in the calmest of sleep, not the slightest cry or moan being heard, and the complete immobility of his features sufficiently indicating the utter annihilation of all sensibility. The respiration continued calm and regular, and, what is remarkable, unattended with those momentary signs of asphyxia which had always been observed in the injections when made in animals, and in the two patients so treated for tetanus. After the operation had been completed, the patient would in all probability have continued for hours in this immovable condition, had not a means of arousing him been tried, which had been found so efficacious in animals—namely, the electric current. One of the conductors having been placed over the left side of the neck, and the other over the epigastrium, after the passage of the current, with forcible and rapid intermissions, the patient awoke, and, sitting up in bed, began talking and shaking hands with everybody around him. He declared that he had felt or perceived nothing whatever. This state of ebriety continued for more than an hour, and was

terminated by crying. He then fell into a quiet sleep, and all anæsthetic effect passed away. "Thus, in this way," Professor Oré observes, "we are enabled to graduate the exact dose of the anæsthetic substance, so as to induce insensibility for as long as may be necessary, and then dissipate the effects at will. Is not this a true solution of the problem of anæsthesia?"

M. Oré feels assured that the complete absence of all irritation of the respiratory organs, as contrasted with what he had observed in his experiments, was due to the precautions he had taken. Believing that the slight appearance of asphyxia, attempts at expuition, etc., which he had observed in animals at the moment of introducing the chloral, were due to the presence of very minute foreign bodies in the solution, he took the precaution of interposing in the syringe employed in this case a sieve which intercepted even the smallest particles.—*L'Union Médicale*, May 12.

Prof. Oré draws the following conclusions (*La Tribune Médicale*, March 22d, 1874):—

1. That intravenous injections are harmless. In the case communicated there was not the slightest trace of phlebitis. There was only a small abscess caused by the penetration of some chloral into the cellular tissue. M. Oré's experiments on animals has taught him that this always occurs, when a large dose is injected subcutaneously. This leads to the important conclusion for the clinician, that the subcutaneous method is the most defective one for the administration of chloral.

2. A second conclusion is the rapid and long insensibility produced by this substance when it is placed in immediate contact with the blood.

3. Hydrate of chloral injected into the veins rapidly arrests tetanic symptoms. Three injections of ten grains each at intervals of 24 hours, produced with sleep complete paralysis of sensibility and motility. M. Oré particularly insists on the circumstance that a small dose of chloral suffices to produce a favourable result.

Finally M. Oré remarks in order that chloral injected into the veins shall arrest tetanic symptoms, it should be administered in a sufficient dose to almost immediately paralyze the reflex action of the spinal cord, and to momentarily completely paralyze motion and sensibility. The dose of ten grammes at each injection appears to him to be sufficient to produce the effect.

Two cases of tetanus treated by intravenous injections of chloral were communicated to the Surgical Society of Paris (*L'Union Médicale*, April 14th), one by M. CRUVEILHIER, the other by M. LEON LABBÉ; in both the result was unfortunate. M. Cruveilhier thinks that the treatment may have contributed to the result in his case, but M. Labbé does not admit that such was the fact in his case; he even believes that his patient might have been saved, had it been possible to have performed a greater number of injections of chloral.

Some remarks made at the meeting of the Surgical Society of Paris, unfavourable to intravenous injections, induced Prof. Oré to send a note to that Society, which was read at their meeting on the 13th of May, and which gave rise to an animated discussion.

Prof. Oré stated (*Gaz. Hebdom.*, May 22) that in injecting the solution into the veins, he has never observed the slightest symptom which could give rise to any fear of the coagulation of the blood in the vessels. [This does not seem to us to accord with the statement made to the Academy of Medicine on the 10th Feb. last, by M. Personne, that when chloral is added to fresh blood it completely coagulates the latter; and that the fear that such might occur is not without foundation, seems to be proved by a case related by M. Tillaux, which we shall presently notice.]

Prof. Oré further maintained that intravenous injections of chloral should be preferred to chloroform for surgical anæsthesia.

M. LE FORR strongly protested against this last assertion of Prof. Oré, and maintained that to practise surgical anæsthesia by the injection of chloral into the veins was to exhibit a profound contempt for human life. In so grave an affection as tetanus, when all other measures are powerless, an excuse may be found for bold experiments, but to employ intravenous injections of chloral to

simply produce anæsthesia was monstrous. In this sentiment MM. Verneuil, Duplay, and all the members of the Society expressed their concurrence.

M. TILLAUX communicated to the Surgical Society of Paris, May 6 (*L'Union Médicale*, May 23), a case of tetanus supervening on the opening of a cyst of the liver. The patient had difficulty in swallowing, followed by true trismus. He prescribed the administration of chloral in divided doses, but the swallowing of each dose excited tetanic convulsions, and the next morning on his visit, the patient appeared to be dying; was unable to swallow, and he determined to employ intravenous injections of chloral. This was immediately done, which at once revived the patient and produced the greatest improvement in his appearance. When M. Tillaux left the patient just previous to coming to the meeting, he entertained the strongest hopes of a successful result, and advanced the following conclusions:—

1. That chloral produces an immediate and marvellous effect in tetanus: 2d. That the method of administering it by intravenous injections does not present the dangers and difficulties with which it has been reproached.

At the next meeting of the Society (*Gaz. Hebdom.*, May 22) M. Tillaux stated that, notwithstanding the injection of 20 grammes of chloral at different times, the patient had died, and that the autopsy showed a coagulum extending through the whole extent of the right cephalic vein and the axillary vein as far as the subclavian vein. In the right auricle a white fibrous clot was found which must have been formed before death, and there was another clot in the left ventricle. The blood had a great tendency to coagulate.

M. Verneuil stated that an Italian surgeon had treated varices by the injection of chloral into the veins, with the hope of thus obtaining a coagulum.

M. Forget maintained that there was great danger in every new therapeutic treatment without first thoroughly studying the agent we employ. M. Tillaux's case was a case of experimental surgery. An agent which will succeed in an animal may not succeed in man, and especially a diseased man. A medicament known to produce coagulation of the blood ought not to be injected into the veins for the treatment of tetanus, for it will produce coagulation of the circulating blood.

35. *Tetanus Treated by Chloral Administered by the Mouth.*—M. CHAUVEL communicated to the Surgical Society of Paris (29th April), two cases of tetanus treated by chloral. One patient took 16 grammes of chloral each day and died at the end of the second day. The other took from the commencement of the disease the same dose every day and died on the third day. In neither case was the chloral of any benefit.

M. VERNEUIL communicated at the same time two cases treated by himself by the same remedy. The first patient took two days after the invasion of the disease 6 grammes of chloral which at once completely arrested the disease, the patient was cured after 25 days treatment. In the second, tetanus supervened ten days after a wound in the head which had almost cicatrized. Ten grammes of chloral were given daily, and the cure was completed in a month. M. V. remarked that it might be objected to his cases that they were chronic; that he thought probable, but he did not think it prudent to wait some days before commencing treatment in order to ascertain whether the progress of the disease was acute or chronic. It may be objected to the administration of chloral by the mouth that some patients cannot swallow. If after administering 15 grammes of chloral no benefit results, M. V. believes it is because the chloral is not pure, or that absorption does not take place from the digestive tube. Finally in some cases the attack is so violent that it is dangerous to wait two, three, or four hours for the effect of chloral administered by the mouth. Some other means of administration must then be sought for. Enemata have sometimes succeeded, but they have the inconvenience of requiring the patient to be moved and consequently tend to bring on the convulsions. Subcutaneous injections are not to be trusted though they may produce temporary relief, and in the treatment of tetanus a very concentrated solution is required, whence result local inflammations. It is easily to be understood then how injections into the veins should have been suggested. The

first to do this was M. Oré of Bourdeaux, but M. V. objects to M. Oré's suggestion of substituting intravenous for other modes of administering chloral. M. V. said he could not inject 10 or 12 grammes of chloral at once into the veins in case of tetanus without feeling great uneasiness, because we do not know in advance what dose may be required to relieve the spasms, and we do know that 2 grammes of chloral given by the mouth sometimes cures at once the affection. Finally, instead of curing tetanus at once, we must suppose that the patient may require to be kept under the influence of chloral for a month; are we then to have the vein exposed during all this time, or every day open a new vein? Trials of this kind should not be discouraged, but it is difficult to admit that the treatment of tetanus should commence by injections of chloral into the veins instead of giving it by the mouth.

In 1868, M. V. had not seen a case of tetanus cured; since that period he has employed chloral and cured 5 cases which give a proportion of $\frac{2}{3}$ cures.—*Gaz. Hebdomadaire de Méd. et de Chirurgie*, May 8, 1874.

36. *Transfusion*.—Remarks were made on this subject at the third meeting of the Congress of the German Society of Surgeons, by KÜSTER (Berlin), HASSE (Nordhausen), SANDER (Barmen), and BERNIS (Holland). Küster pointed out that the effect of animal blood is not equivalent to that of human blood. He performed direct transfusion from artery to artery as proposed by Schliep in the *Berliner Klinische Wochenschrift*, No. 3, 1874, in thirteen cases from sheep, and in two cases from man. The operation was simple, and never interfered with by accidents, and the wounds healed without any disagreeable occurrence. The general symptoms after transfusion of human blood were rather agreeable to the patient, while after injection of a few ounces of animal blood there followed dyspnoea, cyanosis, pains in the back, and shivering, with rise of temperature. These symptoms, however, disappeared after a few hours; and in all cases he observed better appetite, greater cheerfulness and strength for a short time. All the cases were the subjects of anæmia and chronic diseases. Hasse described the mode of operating with two glass tubes and a piece of India-rubber tube, by connecting the artery of a lamb with the vein of the patient. He had observed good results in about thirty cases in which he had operated. Sander, of Barmen, operated after the method described by Hasse, but warned against the indiscriminate use of animal blood. He had a case where oliguria and uræmia followed the transfusion of lamb's blood in a patient with incipient consumption, who had not suffered before from disease of the kidneys. The symptoms of uræmia lasted four days. The patient survived; but, instead of being benefited by the transfusion, he was worse than before, and showed a considerable loss of weight a fortnight after the operation. Bernis related a series of experiments on transfusion performed on dogs and rabbits, and their influence on fever.—*Brit. Med. Journ.*, May 9, 1874.

37. *Cirroid Aneurism treated by Injection of Perchloride of Iron; Death from Embolism*.—Notwithstanding the brilliant success which has attended the employment of coagulating injections by some surgeons, Mr. J. F. West regards them as dangerous especially when the tumours are situated about the face and head, and as evidence of this, he relates (*Lancet*, March 21) the following case:—

Alfred G. F., æt. 9 months, was admitted into Queen's Hospital, Birmingham, under his care, June 2, 1873, with a nævoid tumour, about the size of a small marble, on the right ala nasi, near the tip. It had existed from birth, but was slowly growing, and beginning to involve the left ala. It was soft and compressible, and over its surface large and distended capillaries were seen in three or four spots, each as large as a pea. Deformity from the prominent situation of the tumour necessitated operative interference, and as it was considered that no mode of operation offered so good an opportunity for the prevention of an ugly cicatrix as the injection of solution of perchloride of iron, it was decided to use it. At 11 A. M., chloroform having been given, three drops were injected by a hypodermic syringe into the lowest part of the tumour. The child struggled and cried, but there was no other unfavourable symptom. Three more

drops were then injected into the upper part of the tumour, and three at another highly vascular spot, when, on withdrawing the syringe, the child's face changed suddenly to a dusky hue, the hands and feet became blue, the pulse could not be felt, and the breathing seemed to be arrested; on raising the eyelids, the eyeballs were seen to be fixed and turned upwards and outwards, and the pupils were slightly dilated. The tongue was at once drawn forwards, and artificial respiration kept up for twenty minutes. During some part of this time the child breathed naturally, and then would cease to breathe until Silvester's method was again used. Until 6 o'clock the same evening he continued in a half-unconscious state, with a very feeble pulse, dilated pupils, livid hands and feet, and the angle of the mouth on the right side somewhat drawn down. About every ten or fifteen minutes he would start crying, and then relapse into his former semi-comatose state. During the evening the extremities became warmer and of a more natural colour, the breathing less laboured, and the pulse better; but the eyeballs rolled about, and the child could not be roused to take notice, and could hardly be induced to imbibe milk from his bottle. He continued in this state for three days, when he died, with well-marked symptoms of hemiplegia.

At the post-mortem examination, the membranes of the brain were found slightly congested; the anterior portion of both lobes of the cerebrum, and also the inner surface of the brain as seen in the walls of the lateral ventricles, were reduced to a soft pulp, while the posterior part of the brain substance was in a healthy state. A clot was seen stretching from the right internal carotid artery along the middle cerebral artery of the same side. The lungs were congested. The heart contained a small quantity of dark fluid blood. The liver, kidneys, and other viscera were normal.

That embolism was produced in this instance by the injection of the perchloride of iron does not admit of a doubt, and I therefore unhesitatingly confirm Mr. Thomas Smith's opinion that we are justified in rejecting it as a remedy for nævi on the face.

38. *Ligature of the Femoral Artery for the Cure of Elephantiasis Arabum.*—M. DUMARQUAY, on the 25th March last, exhibited to the Surgical Society of Paris, a woman aged 38, whose left femoral artery had been ligated in 1864 by M. Adolphe Richard for elephantiasis arabum of the left lower limb; the limb subsequently nearly regained its natural size, the skin became supple, and the case was published in the *Gaz. des Hôpitaux* as cured. Subsequently the patient lost the benefit of the operation, and the limb regained its former enormous size. It is thus evident that the announcement of the success of the operation was premature.—*L'Union Médicale*, April 7, 1874. This case affords another proof of the correctness of Prof. Fayrer's opinion that the operation is productive of only temporary benefit.

39. *Elephantiasis Græcorum.*—Dr. LEISRINK relates a case of this kind in the *Deutsche Zeit.*, vol. iv., in which he tied the femoral artery just below Poupart's ligament. The lady, fifty-one years old, had suffered twenty-five years before from repeated attacks of erysipelas in the right leg, and the latter measured twenty inches round the calf, whilst the sound leg measured only seven. She was considerably weakened by oozing of serum, and four days after the operation the size was reduced to twelve inches. It rose a little afterwards, and although the patient was not actually cured, the disease was certainly arrested and modified. Compression of the artery has been tried in this and other countries with varying success, but amputation has almost always proved fatal.—*Lancet*, April 25, 1874.

40. *Strangulated Hernia Successfully Treated by Inversion.*—Our No. for April last contains an article by Dr. LEASURE, on the tractile method of reducing strangulated hernia. In the *Indian Med. Gaz.*, for the same month, Dr. THORNTON records a case of oblique inguinal hernia successfully treated by that plan. The rupture had appeared 26 hours before admission into the Arrah Dispensary, and the patient and his friends had made many attempts to return

the protruded bowel, but without success. Severe pain in the part came on during the night, and finding him getting worse his friends brought him to the dispensary early in the morning. The Sub-Assistant Surgeon then attempted to reduce the rupture by means of the taxis with the assistance of chloroform, but he was unsuccessful. Dr. Thornton saw the patient at 9 A.M. He was in great pain and distress, there had been no action of the bowels since the hernia appeared, and hiccup and vomiting had already set in. Dr. T. ordered the foot of his bed to be raised and supported at an angle of 45° , and directed that he should be allowed to remain in that posture, and that no further attempts to return the rupture should be made. The result was that in about twenty minutes the hernia disappeared, reduction having taken place spontaneously.

41. *Volvulus Treated by (Extra-Peritoneal) Abdominal Section; Breaking Down a False Ligament by Manipulation; Recovery.*—Dr. FREDERICK BETZ reports an interesting case of this, and strongly insists upon the importance of a careful examination of the abdomen by percussion and palpation, as soon as we are called to a case of intestinal obstruction. When this is done at an early date, we can generally learn the most tender spot, and the starting-point of the symptoms of obstruction. This information is of great value, not for mere diagnostic purposes, but as a guide, should we subsequently determine upon operation. If called too late, or if we defer this examination too long, it is very difficult, if not impossible, to determine either the site or the kind of the obstruction with which we have to deal, or to feel justified in recommending an operation. Of late, very great progress has been made in the differential diagnosis of cases of internal obstruction of the bowels; and it is to be hoped that abdominal section will be done more frequently, and at earlier periods than heretofore. The following history affords material for more hopeful prognosis in such cases.

A woman, aged thirty-five, had suffered for some years from femoral hernia of the right side. When she was three months pregnant the rupture became incarcerated, but was reduced without any very great difficulty. During the remainder of gestation it gave her no further trouble, and was not even visible. A month after delivery (the night of July 17-18, 1870) she was seized with violent abdominal pains and eructations. Flatus and fæces no longer passed by the bowels. On the 19th Dr. Betz saw her, and found the right hypogastric region tense, convex, distended, and very tender to touch. The left side of the belly was somewhat sunken in, and not at all tender. Fæcal vomiting had set in. The other symptoms remained as before. Over the swelling the percussion-note was dull; elsewhere normal. The pains extended to the loins, and were remittent. There was no external sign of the old hernia. Digital explorations of the crural canal gave great pain. Three possibilities presented themselves; viz. perityphlitis, internal obstruction (from a twist in the bowel), or strangulation in the crural canal. The globular form and board-like hardness of the swelling were against perityphlitis, whilst all the symptoms favoured ileus. The former history and the local tenderness rendered it probable that there was a Littré's hernia, but this tenderness was afterwards found to be only part of the general sensitiveness to pressure. Morphia was given in half-grain doses every six hours. Cold compresses were applied, and water and ice given freely, but purgatives were religiously avoided. Next day (July 20) she was worse; there was less tenderness, but no improvement in either the local or the general symptoms. Pulse 100. Her countenance was anxious. The ileus had now lasted three whole days. Dr. Betz could see no other means of doing good, except abdominal section, with the view either of breaking down a false ligament (band), or of relieving the possible strangulation in the crural canal by withdrawing the coil of intestine from within. After giving chloroform, he made an incision two inches long through the skin, over the crural canal, in a line between the anterior superior spinous process of the ilium and the spine of the os pubis. The fat and fasciæ were divided partly by forceps and knife, partly pushed aside by the fingers. The external crural ring was found to be quite clear. The abdominal wall was then divided down to the peritoneum. Before opening this, he tested the resistance and mobility of the coils of intes-

tine, using a little gentle force. The patient and himself were conscious of a very evident crack or snap, as if some fibres had given way. He was now convinced that the volvulus was produced by a false ligament, situated in the pelvis (horizontal ramus of the pubic bone), and, since one end had given way, it was now possible for the bowel to untwist, and for its patency to be restored. The peritoneum was therefore not opened, but the wound was closed with a compress, and the cold applications were continued. Shortly after the operation, both pains and vomiting ceased. On the 21st, the swelling in the right side was still perceptible, but less tense. Her general condition was improving; she had no thirst. Pulse 80. No fæces or flatus passed. Clysters of Glauber's salt, and milk and water diet were ordered. On the 22d, flatus and a fairly copious, thin, offensive evacuation passed. The tumour was still perceptible, but less tender, flatter, and less elastic. The wound was already more than half healed by the first intention. Her general condition was good. Pulse 80. The clyster was repeated. On the 23d, the bowels acted pretty freely. On August 15 the wound had healed nicely. Further treatment was simply precautionary, as to diet and regimen. On August 31 she still had slight pain when she lay on her left side. She felt a kind of ball in the original spot; and there was frequent gurgling there, as of gas passing through narrow into wider portions of bowel. Deep pressure in the right hypogastric region gave rise to resistance, and one spot was still tender.

It can scarcely be doubted that, after the breaking down of the false ligament, time was still necessary for the untwisting and gradual restoration to health of the agglutinated and convoluted intestines. Hence the subsequent symptoms. Now that three and a half years have elapsed, she is free from all distress, and has no sign of any hernia. The firm cicatrix, adherent to the abdominal muscles, fulfils the functions of a truss. Dr. Betz modestly attributes this successful result to improved methods of diagnosis and recent additions to our knowledge of the etiology of such cases; and remarks that if "delays are dangerous" in external herniæ, they are still more so in internal obstructions. — *Lond. Med. Record*, March 25, from *Betz's Memorabilien*, vol. xviii. p. 493.

42. *Extirpation of Kidney*.—Dr. G. SIMON reports (*Centralblatt für die Med. Wissenschaften*, March 28, 1874, from *Arch. f. Klin. Chir.* xvi. 48-57) the case of a woman, aged 30 years, who suffered for 18 years from dull pain in the region of the kidney accompanied with purulent and rapidly decomposing urine. Later there was associated therewith from year to year violent attacks of renal colic, which finally became fearfully intense, and continued from 36 to 48 hours. At the same time her constitution began to fail. At times she evacuated with her urine, gravel and grains of phosphate of lime. The patient suffered such tortures that she came over from America to obtain relief by operation. The diagnosis was established. The constant appearance of the pain in the left side and the sensibility of the kidney on pressure, pointed to a local cause for the suffering. Furthermore, the abnormal urine would become during the attack normal, which was to be explained by a stoppage of the left ureter. Prof. Simon also believed that occlusion was excluded, since at no time were there symptoms of the formation of an abscess present. The operation was performed in the way previously described by the author, through the lumbar incision. After laying bare the organ no stone could be detected by palpation, notwithstanding it filled up the entire pelvis of the kidney. The progress of the case was very favourable up to the 21st day; then septicæmic symptoms set in, to which general peritonitis and pleurisy were added, and the patient died on the 31st day. On post-mortem examination the right kidney was found to be enlarged nearly twofold; the left ureter had healed in the cicatrix, and the wound had almost entirely cicatrized. The cause of death must be attributed to septicæmic infection.

Dr. BRANDT, Professor of Surgery in Klausenburg, relates, in the *Wiener Med. Woch.* for Nov. 29 and Dec. 6, an interesting case of the successful extirpation of a kidney after an accidental injury.

S. P., a healthy peasant, aged 25, was, on June 3, 1872, stabbed by a drunken man in the left hypochondrium by means of a pointed table-knife. Three or

four ounces of blood were lost; and after a while attacks of cough came on, which were attended by a protrusion of a fleshy swelling through the narrow orifice of the wound. Twenty-four hours afterwards he was brought to the hospital, when scarcely any signs of anæmia were observable. Exactly opposite the lower edge of the last false rib there was found a flattish fleshy tumour, of a reddish colour, measuring nine centimetres in length and six in breadth, and from which constantly trickled a transparent, straw-coloured fluid. The edges of the tumour were irregular, as if gnawn, and its under surface was covered by a smooth membrane, in part of a dark-red and in part of a whitish colour. From the middle of this lower surface, a pedicle, six centimetres in circumference, extended into the wound of the abdomen, giving the tumour the appearance of a mushroom. This pedicle was surrounded also by a smooth membrane, which was torn in several places whence escaped some of the above-mentioned fluid. It was firm to the touch, evidently containing vessels, which, however, conveyed no pulsation. The oblique wound in the hypochondrium through which this pedicle passed was about three centimetres in length and one and a half in breadth, having sharp edges, with which it embraced the pedicle. To the touch the tumour was moderately firm and painless (pain only being produced by traction on the pedicle), and its temperature at the surface was lower than that of the rest of the body. The tumour upon the whole much resembled the section made on examining a kidney, and under the microscope the shades of colour characterizing the cortical and pyramidal substances were made out. The abdomen in the vicinity of the wound was quite normal in appearance, but in the left lumbar region there was a remarkable oval-shaped sinking-in. The tumour was very movable on its pedicle when rotated, and this last admitted of some elongation, which, however, produced great pain in the pedicle and the abdomen, but not in the tumour itself. The general condition of the patient was unexpectedly good, the pulse being twenty-four hours after the accident about 80, and the temperature 37.8° C.

The appearance of the tumour and the analysis of the urine which trickled away (which is given in some detail) showed plainly that it was the kidney that had suffered an injury. The organ had evidently been cloven to within its calyces; but what amount of injury the ureter and the vessels had undergone could not be ascertained. It could hardly have been supposed that a knife could have been driven through the abdomen right into the kidney, without injury being done to the peritoneum; but the absence of all symptoms proved that such had been the case. After considering at some length the various probabilities of the course the case would take if the kidney were allowed to remain where it was, and of the effects which its removal might exercise on the economy, Prof. Brandt proceeded to its extirpation four days after the injury. The patient, indeed, continued in a very favourable state for the operation, having the day before its performance walked some distance in order to be photographed, occupying two hours in assuming the necessary positions. For the three days prior he had passed little urine, and this contained albumen, derived at all events in part from the injured kidney, which at its injured surface furnished it abundantly. On the day of the operation the pulse was 70, and the temperature 37.6° . The purulent secretion from the injured kidney had considerably increased. A double silken ligature was passed by means of a straight needle through the middle of the pedicle, which was tied in two portions, the kidney itself being separated by means of the knife. No hemorrhage followed. A daily report of the condition of the patient and the quantity of urine secreted is given from June 7 to 22. From this it results that considerably more than half of the urine usually secreted by the two kidneys was furnished at all times by the single one, and on some occasions this amounted to the entire normal quantity. In the whole course of the case no symptoms of an uræmic or peritonitic character occurred. The patient has been frequently seen since his discharge, and continues well.—*Med. Times and Gaz.*, January 24, 1874.

There have been recorded eleven cases of extirpation of the kidney, of which eight died, and three recovered.

The notes of eight of the cases are to be found in the No. of this Journal

for January, 1873, page 277, which, with the one noted below, we have the excellent authority of Surgeon Otis (*Medical and Surgical History of the War of the Rebellion*, Surgical Volume, 2d Part) for saying constitute all the reported cases up to the date of his writing (1873).

Dr. CHAS. L. STODDARD, of East Troy, Wis., reports (*Med. and Surg. Reporter*, 1861, vol. vii. p. 126) the case of a man, aged 58 years, from whom the kidney was extirpated on account of encephaloid disease, the operation having been undertaken in the belief that the mass was a cystic tumour of the liver, and its true nature was not discovered until after the operation was performed. The patient survived fifteen days, and died from exhaustion believed to be due to the extensive suppuration which followed the operation.

43. *Billroth's Case of Extirpation of the Larynx and Epiglottis; Artificial Vocal Diseases.*—In our preceding number, p. 556, we gave an account of this remarkable operation, and now add a report of the subsequent history of the case as communicated to the *Irish Hospital Gazette* (May 1), by Dr. CARL SCHWAIGHOFER.

The wound healed rapidly, and what after the operation was four inches long, had soon contracted so much as to necessitate the use of the knife to allow of the insertion of a medium-sized canula. In like manner the cavity formed by the removal of the larynx contracted so much that its sides were only kept from contact by the apparatus which was inserted. The effect of the contraction of the cicatrix on the trachea was to draw it powerfully upwards, and thus the wound made in the œsophagus by the operation was considerably lessened. The apparatus invented by Billroth's assistant, Dr. Gussenbauer, consisted of three parts—1. An ordinary Trendelenburg's canula, of large calibre and good length, and having a large oval aperture at the point of greatest convexity. This canula was inserted into the trachea, and fastened in its place in the usual way. 2. A second canula with the same curvature, and just so much smaller as to fit accurately within the first. This also had a large corresponding oval opening. This canula was inserted into the former, but in a contrary direction; that is to say, its inner end, instead of pointing, as that of the first did, towards the trachea, pointed towards the pharynx. In these positions the two oval openings corresponded, and the passage for the air from the trachea to the mouth was free, and the patient could, by closing the opening, breathe through his mouth. That part of the apparatus which was intended to produce the voice, consisted of a short, straight canula, open at one end, closed at the other. In its walls, and exactly opposite each other, were two openings. Further, it was divided down the centre by a partition, in which was inserted the metal tongue which, by its vibrations, produced the voice sounds. This latter canula was inserted into the second, and fixed by means of a sliding-ring. When the three canulæ were in position the openings corresponded; and when the patient closed the outer opening the air was compelled to pass through the third canula, and in so doing to cause the metal tongue to vibrate and thus produce sounds. The patient is, however, able to inspire through the lower opening without causing the metal tongue to vibrate sufficiently to produce a sound. By means of this apparatus the patient can make himself understood in a large room, although, as would be expected, the tone of his voice, though not to say unpleasant, is rather monotonous. He has no difficulty in taking solid food, and it is only when he tries to swallow fluids rapidly, that a drop sometimes falls into the canula; which is, however, easily again cleared by the patient coughing. The man has recovered his former healthy and robust appearance, and as no attempt has been made at the formation of further new growth up to the beginning of March, the man was then discharged from the Hospital, and has returned to his former occupation a living and happy triumph of modern surgery, and, more especially, of the skill and daring of Professor Billroth.

44. *Resections of the knee.*—According to M. CHERRU the following are the statistics of all the resections of the knee in the French Army during the Franco-Prussian war, and the war of the Commune (1870, 1871). Of 65

partial resections of the knee involving only the condyles of the femur, there were 62 deaths. Of 37 complete resections, involving both femur and tibia, there were 33 deaths and 4 cures. The resection of the knee then was followed by less favourable results than amputation of the lower part of the femur.

M. PENIÈRE states in his thesis that of 20 resections of the knee there were 17 deaths; but 4 resections made in Paris during the siege must be added. According to M. Le Fort, of these last four cases three were cured.—*Gazette Hebdom.*, April 17, 1874.

45. *Tibio-Calcanean Osteo-Plastic Operation.*—M. J. LE FORT describes the following operation as an improvement of Pirogoff's osteo-plastic method. He commences the incision 2 centimètres (.8 inch) below the malleolus externus, and directs it forwards to the middle third of the os calcis. On arriving at this point, the knife describes a curve whose anterior convexity corresponds with the astragalo-scapoid articulation; as soon as the internal ligaments of the foot are reached, the knife is directed backwards, and stopped at a point 3 centimètres (1.2 inch) in front of the inner malleolus. Then lifting up the foot, he fashions a plantar flap equally convex with the dorsal, passing transversely under the sole of the foot, and meeting the external incision below the outer malleolus. Next, the dorsal flap is dissected up, in order to find the tibio-dorsal articulation, and great care is taken in isolating the flap so as not to wound the posterior tibial vessels. Dividing the ligaments attaching the foot to the fibula, the point of the knife is thrust between the os calcis and the astragalus, as in the subastragaloid amputation, and the interosseous ligaments are divided. The foot is then separated and dislocated inwards, and the posterior flap fashioned as in Chopart's amputation. In order to disengage the astragalus, it is seized with a strong pair of forceps, and all attachments to the leg are divided. It only remains then to saw the os calcis from behind forward, from which the whole superior articular surface is removed, in such a way as to extend forward close to the articulating surface with the cuboid. Afterwards, all the soft parts being isolated, the articular surface of the tibia and fibula are sawn off, and the cut surfaces of the bones placed in apposition. M. Le Fort maintains that by this method he obtains a firm and perfect basis of support, without the grave inconveniences attending Pirogoff's method.—*Lond. Med. Rec.*, March 25th, from *Gazette Hebdomadaire*, Nov. 7, 1873.

46. *Fractures of the Skull with Reference to Operative Interference.*—Dr. CORLEY, Surgeon to Jervis Street Hospital, relates (*Dublin Journ. Med. Sci.*, April, 1874) five cases of fractures of the skull to illustrate the statement of Mr. J. Hutchinson that depression of bone is rarely the cause of symptoms of compression, and defines the cases in which he considers trephining should be avoided and when necessary.

1. *Simple fissure.*—For this fracture the operation should never be performed. True, that accompanying the injury there *might* be localized extravasation of blood; or, subsequent to and consequent on it, there might be formation of matter, which may require the application of the trephine, but the operation then has no reference to the fracture.

2. *Simple comminuted fracture.*—A fracture may be simple externally, but the inner table may be more extensively fractured, and fragments may wound the dura mater or brain. This condition cannot be guessed at until symptoms of intra-cranial mischief arise—for them, and not for the fracture, we may trephine.

3. *Depressed fracture.*—I do not make any distinction between simple depressed and compound fracture as to operative treatment. The latter is more liable to be followed by intra-cranial mischief. As long as no symptoms are present, or *if present, until we have tried all other means of removing them*, we should not operate. If obliged to interfere we do so with little hope, as the symptoms are most likely to own an origin other than the depressed bone.

4. *Depressed fracture comminuted*—including that which is known as “punctured” fracture, such as may be produced by the stab of a pointed weapon, kick

of a horse, or blow of a sharp stone.—In many cases of this description it may be necessary to operate at once, *whether symptoms be present or not*. If the surgeon has reason to believe that in a punctured fracture spiculæ of bone are impinging on the surface of the brain and lacerating it, he is bound to interfere at once. The cause, nature, and position of the injury, and the peculiarities of the symptoms, if any be present, will be all of value in assisting him to arrive at a correct determination. However, in this case—the only one in which I would sanction interference without symptoms—much must be left to the experience and judgment of the surgeon. With reference to this particular point, I shall draw attention to the remarkable cases reported by my colleagues, Drs. J. Stannus Hughes¹ and Meldon,² and it will be confessed that they more than justify the latter part of Liston's aphorism—"that scarcely any injury of the head is too grave to be despaired of."

47. *Treatment of Cystic and Fibro-cystic Bronchocele*.—Dr. MORELL MACKENZIE read a paper on this subject before the Clinical Society of London (April 25, 1874). At the end of 1873, Dr. M. had treated 68 cases of cystic goitre, and 19 of the fibro-cystic variety. Of the cystic cases, 54 were cured, 11 were too slight to require treatment, and in 3 instances cardiac disease rendered it undesirable to employ radical treatment. Of the fibro-cystic cases, 11 were cured, 4 greatly benefited, and 1 died, whilst in 3 cases, the disease, being slight, did not call for interference; and 1 patient discontinued attendance during the treatment. In the cystic cases, the cyst was first emptied with a trocar at its most dependent part. A drachm or two (according to the size of the cyst) of a solution of perchloride of iron was then injected and the canula plugged, the iron being left in the cyst; after seventy-two hours, the plug was removed, and the iron solution withdrawn. The plug was then reinserted, and poultices of linseed meal kept constantly applied for a few days (sometimes for ten days or a fortnight) immediately over the cyst. In a few days, suppuration was set up, and the plug was then permanently removed, the canula, however, being allowed to remain in the cyst until the secretion was limited in amount and thin in consistence. The duration of treatment was generally from three weeks to four months, according to the size of the cyst, the usual time being from six to eight weeks; if, however, the first injection were removed too soon, the process might have to be repeated two or three times, and thus the duration of the cure would be prolonged. In the fibro-cystic cases, the cysts were first treated in the manner described, and the fibrous structure afterwards attacked with subcutaneous injections of iodine. In the only fatal case—one of fibro-cystic substernal goitre—death suddenly supervened from the injection of air into a vein. In order to avoid such an accident in future, the author now uses a syringe with a long bent nozzle, which is so constructed that it cannot be completely emptied during the injection. With this precaution, he believes that the risk is entirely removed. Several cases were related in detail, and the following were the conclusions at which the author had arrived: 1. Any cystic goitre which has attained the size of a hen's egg requires to be actively treated, even when the symptoms are not urgent; 2. Smaller cysts, which give rise to serious dyspnœa or dysphagia, likewise require to be treated; 3. The conversion of the cyst into a chronic abscess is the safest and most certain mode of treatment; 4. Suppuration is best set up by injections of the perchloride of iron, as the disposition to hemorrhage is thereby effectually controlled; 5. Injections of iodine (in cystic goitre) are dangerous, because often followed by sloughing; 6. There is a risk in the treatment by injections of iron, from the occurrence of too profuse suppuration when the cyst has been allowed to attain too large a size before treatment; 7. All operations on the neck are attended with the danger of air entering a vein and causing sudden death; 8. This risk is in proportion to the development of the veins, and the propinquity of the tumour to the heart; 9. In pure cystic goitre, the chance of this occurrence is so slight that it may be dismissed from consideration; 10. In certain kinds of fibro-cystic goitre, viz., those in which some

¹ Irish Hospital Gazette, No. 193.² Dublin Medical Journal, No. 4, 1872.

of the original gland substance is contained in the cyst, especially in substernal fibro-cystic goitre, the risk is at its maximum; 11. The extirpation of cysts is always attended with great danger from hemorrhage; 12. Extirpation is, nevertheless, justifiable where (the symptoms being urgent) the cyst has attained an enormous size, and has a capacity of several pints, but is not directly connected with the trachea or œsophagus; 13. Extirpation is justifiable where such a cyst has already burst and the patient is in danger from an exhausting discharge. 14. Extirpation may also be employed for the removal of a small but distinctly pedunculated cyst, having, for instance, a capacity of two or three ounces, provided there be no large vessels in its peduncle.—*Brit. Med. Journ.*, May 16, 1874.

48. *The Contra-indications to the Removal of Melanotic Tumours, derived from the Examination of the Blood and the Urine.*—It is important to know before extirpating a melanotic tumour whether the viscera have also become the seat of the morbid growth or not; and M. NEPVEU (*Gazette Médicale*, No. 5, 1874, p. 59) has lately shown that this point can be settled with almost absolute certainty by examining the blood and urine of the patient microscopically. The white corpuscles are found, in cases of visceral implication, to be increased in number, so that with Hartnack (ocular iii., objective 7), fifteen, twenty, or even forty are visible in one field, and they contain, in addition, fine blackish granules of pigment. The serum shows small brownish-red granules, and also flexible granular casts without consistence, and analogous in form to those occurring in the urine in Bright's disease. These, M. Nepveu considers, are moulds of capillaries. The red corpuscles seen *en masse* may have a more or less distinctly pronounced sepia tint.

The urine is darker in colour than ordinary, and assumes a blackish hue if nitric acid or bichromate of potash be added to it. Under the microscope cylindrical masses are seen in the deposit, or else irregular accumulations of brown granulations, like the hyaline casts of Bright's disease in form. If the urine be allowed to evaporate in the air, clumps of fine grayish granules become visible, which surround crystals of various shapes, all of which have a dark hue.

As examples of the application of these facts to diagnosis, M. Nepveu relates two cases. The first was that of a man of thirty, from whose thigh a pigment mark had been removed because it had become irritated by the friction of his trousers. A few months afterwards the glands in the groin enlarged, and an incision was made into them, under the impression that there was suppuration; but instead of that a fungoid growth appeared, which rapidly increased in size, and extended up into the iliac fossa. The blood and urine were examined a little while before the patient's death, and found to have the characters previously described. At the necropsy, metastatic nodules of melanotic sarcoma, resembling the primary tumour, were found in the liver and lungs, in the bones of the cranium and sternum, and in some of the lower ribs. There was not a single nodule in the kidneys, but the whole organs had a slight sepia tint, with one or two pigment spots scattered here and there; so that melanuria does not point necessarily to implication of the kidneys themselves, but only to the presence of a great amount of pigment in the blood, and so to its generation in the other viscera. In a second case one melanotic tumour was removed from a man of fifty-one in December, 1871. In 1872 he had a relapse, and he died in November, 1873. His liver, spleen, kidneys, and osseous system were the seat of secondary deposits, and the diagnostic signs of visceral affection were previously found in the blood and urine.—*Med. Times and Gaz.*, March 28, 1874.

49. *Extirpation of the Spleen.*—Dr. WATSON showed, at a meeting of the Medico-Chirurgical Society of Edinburgh (*Edin. Med. and Surg. Journ.*, Feb. 1874), a spleen "weighing nearly 12 lbs., which, on the 1st November, 1873, he had removed by gastrotomy from a man who had noticed the tumour for more than two years. It filled a great part of the abdomen, displacing the organs. The patient was reduced to a most anæmic condition, and pressed the performance of the operation. The pedicle of the tumour was transfixed by a strong double ligature and tied in two halves. The vasa brevia from the stomach gave much trouble in securing them."

OPHTHALMOLOGY.

50. *Derangements of Vision and their Relation to Migraine.*—Dr. T. CLIFFORD ALBUTT, in an interesting review (*Brit. and For. Med.-Chir. Rev.*, April, 1874) of Dr. Liveing's work on migraine and some allied disorders, says: "I remember being much disconcerted by the occurrence of hemiopia in my own person about fifteen years ago. I was then scarcely aware of its relation to migraine, and feared some serious bodily calamity. On inquiry I came across the proper history of the symptoms, and have disregarded my few subsequent attacks. My father had migraine severely up to middle life, but myself am and have been wholly free from any form of headache. Take vomiting again. How many of us are acquainted with nervous patients who have periodical attacks of vomiting, which own no obvious cause; are not these very probably to be referred to partial migraine? So much for the limits of variation on the side of partial or milder phenomena, but to know what these limits are in the direction of severity is even more important. Take the following: A gentleman was seized suddenly, first with blindness, of which he complained, then in a few minutes he became aphasic, in a few minutes more he was hemiplegic of the right arm and leg, and perhaps slightly unconscious for a brief interval. Then he vomited freely, and when I saw him had practically recovered. After an anxious consultation his medical attendant and myself ventured to hope that the attack might belong to the migrainous species, though there was no headache. We based this on the rapid recovery, on his well-marked neurotic habit, and on the history of overwork and anxiety. We were probably right; the attacks have recurred some dozens of times in the last five years, and in varying degrees, but have been much reduced in frequency and severity by appropriate medical and other treatment.

"Again, before I left home for my holiday in the summer of 1873, I was most urgently called, with one of my colleagues, to see a lady, about forty years of age, under the following circumstances. She has been subject to migraine for many years. On a Saturday she had complained, as usual, of a bad 'bilious attack.' This lasted during the Sunday, when she was very sick, but she was able to walk from one room to another and give a few orders to a servant. On the Sunday evening, however, when her husband and family expected her to recover as usual, she gradually became lethargic. When I saw her on the Monday she could only be roused with great difficulty, and this to a very small extent. She could not or would not put out her tongue; she was completely paralyzed on the right side, and her eyes presented a conjugate deviation to the left. On the Tuesday she was much the same, save that she showed some signs of returning consciousness, and my colleague and myself were constrained to give the opinion that the case was one of encephalic hemorrhage. On the Thursday I met her husband by chance, and he said she seemed better, but we had a long talk about her apparently sad prospect. She was a lady of great accomplishments, and her right hand was almost her life to her, but I begged her husband to let things alone, and to avoid any active interference, such as faradism, until he had full leave from his advisers. I then left for a month. On my return one of the first patients who walked into my consulting room was Mrs. —, who entered briskly, smiling and holding out her right hand, which I shook warmly. It was perfectly restored, and she was not only quite well, but very soon after her attack she was using her fingers for the finest art work. A few days then had completed her recovery from a state which certainly seemed desperate, a state, however, which immediately followed a distinct attack of migraine. She had not only been subject to migraine for many years, but twice or thrice in her adult life she had been suddenly struck with aphasia, which, although rather severe at the time, had passed away in a few hours or less. These two cases, and some others of less severity which I have seen, would seem to associate migraine with loss of controlling power in the anterior part of the left hemisphere (*vide* Liveing, p. 96). If subsequent inquiries can prove to us that migraine can put on so grave a form as we have hinted, we cannot make these facts too widely known (*vide* Liveing, p. 221).

51. *Transitory Embolism of the Central Artery of the Retina.*—Dr. L. MAUTHNER refers to a number of cases in which sudden blindness has occurred, but after a time has been as suddenly recovered from. Sometimes these cases ultimately result in permanent and total blindness. The suddenness of the blindness certainly suggests embolism; but it seems difficult under this view to account for the perfect and sudden recovery. The author had the good fortune to examine a case during the period of blindness. A man suddenly had partial loss of vision, which soon became complete. On ophthalmoscopic examination there was perfect anæmia of the retinal arteries, evidently the result of embolism. But in a few minutes the blindness disappeared, and the vessels were found to have returned to the normal condition. This result was evidently not due to the embolus which had obstructed the vessel breaking up, and its fragments being carried into the branches of the artery, because such a condition would be readily enough detected. A very probable explanation is suggested by the author. He reminds us that the central artery of the retina is a branch of the ophthalmic, and that probably in these cases the embolism has stuck just at the off-giving of the branch, this being in accordance with the general fact that emboli usually stick fast at the point of bifurcation of an artery. In such case the obstructing shred would project in part into the ophthalmic and in part into the central artery, obstructing the latter, but probably only partially filling the former. Now the current of blood in the ophthalmic might readily enough wash away the embolus, and the portion of it in the central artery might be drawn out and carried off. The ophthalmic artery is distributed to the skin, and a small embolus in it would not produce very distinct symptoms.—*Glasgow Med. Journ.*, April, 1874, from *Stricker's Medizin. Jahrbücher*, No. 11, 1873.

[We may here refer to the interesting article by Dr. Loring on Embolism in our number for April last, in which he shows that there is reason to doubt whether some cases of sudden blindness ascribed to embolism are really produced by that cause.]

52. *Treatment of Cataract previously to Operation.*—Mr. CRITCHETT regards it as the duty of the surgeon to warn his patients of the nature of the disease when it has but barely commenced, and when a long and anxious time must elapse before any operation can be attempted. Mr. Critchett, even at the risk of appearing to overlook the true nature of the case, would be reticent, knowing how the thought of impending blindness from cataract is dreaded.

Another question which has to be met is, whether there is any cure, any means of removal by medicine or otherwise, short of an operation. It is at this time that patients with cataracts are apt to fall into the power of quacks and charlatans. Though the answer to this question must be a decided negative, yet there is much that may be done to relieve the present discomfort; for instance, the amount of light may be regulated by the employment of proper glasses, and by the continued use of atropia in solution. It will be well too that the patient should be seen at regular intervals, in case the commencing cataract may be the precursor of some more serious condition, such as glaucoma; and by degrees the knowledge that the increasing dimness of vision is due to cataract and to nothing worse, may in itself be a reason for looking hopefully to the future.

The time for operative interference has arrived when—

1. The cataract is completely matured;
2. The lens of the second eye is also so opaque that the patient is on the point of having to relinquish his occupation.

The social position of the patient must be borne in mind; but the second condition is to be insisted upon, because surgeons of the old school used to delay till blindness was complete, and there is a tendency amongst some surgeons of the present day to adopt the other extreme and to attack every single cataract at once.

There are some cases of cataract which will, Mr. Critchett thinks, always give rise to difference of opinion, and which indeed are embarrassing; viz., when there is very great impairment of vision while the cataract is yet far from

maturity. Is the surgeon to operate upon an immature lens? or is he to hasten the maturity by some operation? The latter course Mr. Critchett believes to be full of danger; and, except in cases where the cortical layers of the lens are much involved, it is, he thinks, the duty of the surgeon and in the patient's interest to wait. In the case where one is cataractous and the other quite sound, Mr. Critchett thinks that in young subjects it is well to operate, but in elderly patients, while one eye retains its perfect power, the cataract in the other should not be interfered with.—*London Med. Record*, May 20, 1874, from *Annales d'Oculistique*, Sept. and Oct. 1873.

53. *Prolapse of the Vitreous Humour*.—MR. PIERMÉ in a recent work gives the results of his studies relative to the anatomical changes which take place immediately after the loss of vitreous humour and on the question of its redevelopment, by the light of experiments on animals as well as from its clinical and surgical aspect, and his results are embodied in four chapters. The first chapter is devoted to the normal anatomy of the vitreous humour. The second gives an account of his experiments performed upon rabbits. The third is devoted to clinical observation; and, in the fourth, are summed up the conclusions derived from the preceding three.

The results of the experiments made upon the eyes of rabbits showed that, when a small quantity of the vitreous humour had been removed by means of a small syringe, the operation was a very simple one, and was attended by no evil consequences, no hemorrhage, nor any inflammation of the coats of the eye. Thirteen such experiments are recorded, and in all, the eye, which was soft and somewhat shrunken after the operation, in a few hours had regained its normal tension and appearance. The author asks whether, in these cases, the vitreous humour reproduced is identically the same, or, merely a new substance, more or less resembling that which had been lost; and he feels inclined to admit the reproduction of a veritable vitreous humour, and for the reason that the fluid removed from the vitreous chamber is the structureless and albuminous fluid which is again speedily reproduced from the surrounding bloodvessels. M. Pierné even admits a renewal to a certain amount of the nucleated cells described by Iwanoff. Surgical experience shows that a man may lose vitreous humour in consequence of a wound of the sclerotic, and in a short time the eye may regain its normal appearance and may retain its sight; and it has been the experience at some time or other of most surgeons, that on the day following a cataract operation, during which vitreous humour has been lost, the tension of the eye has been completely restored. It is, however, probable, that such eyes are never so sound or so well able to withstand disease, as those which have passed through the operation without accident. The case is far otherwise, however, when the loss of vitreous humour has been considerable; there is then the risk of choroidal or retinal hemorrhage with detachment of the retina perhaps, or, in the instance of a cataract extraction, the fragments of the cortical substance which are retained in the eye may become the exciting cause of proliferative changes, and take the shape of suppuration, or of membranous opacities which must prevent useful vision.

The conclusions arrived at by M. Pierné are as follows:—

1. The vitreous humour is reformed readily and speedily both in the eyes of man and of the lower animals.
2. Prolapse of the vitreous humour is of greater danger when the wound is large, and naturally the gravity of the accident is greater in proportion to the amount of the loss.
3. The vitreous humour may become the seat of an inflammation in consequence of a wound, and this inflammation may terminate by resolution, by suppuration, or may become chronic.
4. The immediate evil consequences of prolapse, generally have their origin in the choroid; and the ultimate result is atrophy of the eyeball.—*London Med. Record*, May 20, 1874.

54. *Foreign Bodies lodged within the Eye*.—MR. C. S. JEAFFRESON, Surgeon to the Eye Infirmary, Newcastle-on-Tyne, makes (*Med. Times and Gaz.*,

March 28, 1874) some judicious remarks on this class of accidents. "There is one rule in ophthalmic surgery," he says, "which will help us to deal with a large class of these cases, and it is this: *That an eye which has been damaged by accident or disease, and which is no longer useful for visual purposes, is a dangerous organ, and should be removed.* I do not wish to assert that this rule should always be rigidly carried out as regards eyes which have been destroyed by idiopathic disease, although I think, in these cases, a rigid conformity to it would rarely carry us astray. In traumatic cases I firmly believe that it can never safely be departed from, and should be carried out as soon as we have convinced ourselves that the visual power is gone, or will be so low as to be practically useless. Scarcely a day passes in my public and private practice without my seeing a case of sympathetic ophthalmia, which might have been averted had this rule been thoroughly understood by the bulk of practitioners; and every year a large number of persons are consigned to a life of darkness and misery from a want of appreciation of the importance of it. Patients have a great horror of enucleation, and require usually a great deal of pressing to submit to it; and for this reason the surgeon must be firm and unflinching, and must indicate the necessity for action in the most forcible language.

"Now, in by far the larger number of cases in which foreign bodies are lodged in the deeper parts of the eye, the visual power will have been destroyed immediately, or will certainly depart after a few days, and it will only be in exceptional cases that difficulty will arise in determining what should be done.

"Sometimes we may have an opportunity of extracting the foreign body, and there are some few cases on record where intruding substances have been extracted from the vitreous chamber, but it rarely happens that the combination of circumstances is sufficiently favourable to allow of this course being pursued. In my experience the vitreous becomes very quickly turbid after an injury, and the chance of extraction is slight, unless the patient is seen almost immediately after the accident, and when the position and relation of the foreign body can be unmistakably made out. Indiscriminate fishing for the intruding substance (a practice I have seen adopted more than once) is much to be deprecated, and can lead to no good results. Sometimes we may have strong reasons, from an examination of the track of the wound and other circumstances, for suspecting that the foreign body lies in a certain position, although we may not be able to see it. It is then justifiable to make a small incision in the sclerotic over the suspected spot; and cases are on record where this has been done with success. I need scarcely say these operations should never be undertaken by persons wholly unpractised in the delicate manipulations of ophthalmic practice. When patients are seen soon after an accident, it seldom happens that there can be much difficulty in deciding whether a foreign body is embedded in the vitreous or not, especially when it has passed through the cornea and iris, or lens, and there is little blood effused. It may be more difficult to diagnose between simple penetration and lodgment when the wound is made directly through the sclerotic, as we naturally miss the visible evidence of wounded intraocular structures.

"What should, then, guide our treatment in doubtful cases? In my opinion the following circumstances:—

"1. If there are the slightest signs of sympathetic ophthalmia in its fellow, the injured eye should be immediately excised.

"2. If vision is absolutely lost beyond hope of recovery, the eye should be sacrificed.

"3. If the wound is in the ciliary region, and there is no prospect of really useful vision, the eye should be excised.

"4. If the wound is not in a dangerous region, and the impaired vision seems to be in a great measure due to effused blood, I should not advise immediate operative interference.

"When once we have made up our minds that enucleation is necessary, is it advisable to wait till acute inflammatory symptoms have in a measure subsided? For my own part I think not. I have frequently performed enucleation during the most acute inflammatory stages, and I never have seen any bad

results follow. I believe by following this rule we may frequently curtail a great deal of pain and anxiety which would have been incurred by waiting.

"When foreign bodies are lodged in the anterior chamber, lens, or iris, they are generally clearly visible, and may usually be removed without much difficulty whilst the structures are still transparent. When they are lodged in the lens, no time should be lost, for sometimes it happens that a body which remained *in situ* whilst the lens was firm, disappears behind the iris when the lenticular matter becomes diffuent, and, if extraction be attempted at this period, special care must be employed, as the lenticular matter not unfrequently flows out, leaving the foreign body hidden by, or entangled in, the folds of the iris.

"Occasionally a foreign body which has been lodged in the eye will escape spontaneously."

55. *Tubercular Ulceration of the Conjunctiva*.—Dr. H. SATTLER, Assistant at Prof. Arlt's Ophthalmic Clinique, reports the following case of this hitherto unobserved disease:—

The subject of it was a tall, spare, pale man, who, according to his own account, had until lately been perfectly healthy. When I first saw him he was under treatment at Prof. Schrötter's Laryngoscopic Clinique, for a hoarseness of which he had been complaining for the last six months. In the course of the previous two years he had often had a cough. He had now been complaining frequently, for some months, of a burning sensation in the left eye. Upon examination I found the lids of this eye somewhat red and swollen, with numbers of dilated veins visible through the integument. The semilunar fold of the conjunctiva was very swollen and red, and the bulbar conjunctiva slightly injected, while the cornea and the deeper parts of the eye were perfectly normal.

The conjunctiva of the under lid was uniformly red and velvety. Scattered over it were several small ulcers, the largest being oval in shape, and measuring two lines in its long and one line in its short diameter. These ulcers had sharply cut margins, and their floors were covered with a grayish exudation. There was little or no inflammatory reaction in the conjunctiva surrounding the ulcers.

The upper lid was enlarged in every dimension, and flaccid. The entire retro-tarsal fold, as well as the conjunctiva covering the upper portion of the lid, was occupied by one extensive ulcer, the floor of which was hidden by a yellow, creamy exudation, its margin being jagged and sinuous. That part of the conjunctiva which the ulcer had not attacked was greatly injected, and the papillary bodies swollen. Towards the inner angle, the ulceration extended slightly on to the bulbar conjunctiva, as well as to the semilunar fold. Its boundary in this direction was not well defined, and here, too, the conjunctiva seemed swollen from infiltration.

Owing to the extreme rarity of tubercular ulcers of the conjunctiva, suspicion was directed to syphilis as the fundamental disease; and, in fact, the ulcers were at first regarded as being of secondary syphilitic nature. At the same time it was not possible to obtain any certain sign of previous syphilis either from the anamnesis, or from objective appearances on the body of the patient. The ulceration in the larynx was at once recognized as tuberculous by Prof. Schrötter, and the further progress of the case, too, spoke decidedly against syphilis. The ulcers of the conjunctiva were painted with a solution of corrosive sublimate, and touched with solid nitrate of silver at intervals of three or four days, while, a little later on, some mercurial inunctions were administered. The patient, however, became more debilitated. A healthy condition of the surface of the ulcers could not be attained; on the contrary, they extended more to the bulbar conjunctiva, and fresh ulcers formed upon the under lid. The way in which these formed was characteristic. At first a pale grayish and slightly prominent point appeared in the conjunctiva; gradually this became more of a yellowish shade, and then became abraded on the surface, producing an ulcer about the size of a pin's head, which slowly increased in size, and became confluent with others in the neighbourhood.

The patient's death took place about six weeks after he came under observation, and the autopsy removed all doubt as to the true nature of the affection.

No trace of syphilitic products could be found. In both lungs, besides old star-shaped, depressed cicatrices, there were yellowish, cheesy masses distributed; some solitary, and some collected in groups. In the cœcum and ascending colon extensive ulcers were found, the margins of which were steep and sinuous, and in their neighbourhood were many of those yellow cheesy masses. The free margin of the epiglottis presented the appearance of having been gnawed away, the cartilage being here and there laid bare. The mucous membrane on the inner wall of the larynx was ulcerated.

The microscopic examination of the conjunctiva was most interesting, and showed a condition highly characteristic of tubercular disease. There was an intense cellular infiltration of the conjunctiva. In the tissue of the membrane itself, as well as in the subconjunctival cellular tissue, distinctly circumscribed collections of round cells were found, the cells lying very close together. The periphery of these cellular aggregations became much more readily coloured with carmine than their centres. A careful examination showed, then, that the cells in the periphery were rich in protoplasm and contained several nuclei, while the centre was occupied by small cells having but one nucleus, by the shrunken remains of cells, or by detritus. The deeper lying aggregations of cells contained only well-formed elements, but the nearer the surface they lay, the more certain could one be of finding retrogressive changes in them. By the decay of these superficial aggregations the ulcers were produced, and the rapid extension of the latter was caused by the formation of fresh centres upon their floors and margins, as well as by the diffuse cellular infiltration which abounded. The ulcers penetrated deep into the upper lid, involving the Meibomian glands. The inflammatory reaction in their neighbourhood was but very slight, and there seemed to have been no attempt made at reparation of the loss of substance. With regard to the origin of the circumscribed cellular aggregations, I may say that some of them seemed to be simply hyperplastic lymphatic follicles (or trachoma glands), in the centre of which necrosis had come on. I ascertained also the origin of others beyond doubt from a circumscribed proliferation of the corpuscles of the adventitia of the small arteries and capillaries; which coincides with the observations made on the formation of tubercle in the pia mater, and in some other places.—*Irish Hospital Gaz.*, April 1, 1874.

MIDWIFERY AND GYNÆCOLOGY.

56. *Twin Pregnancy in a Double Uterus.*—Dr. PERRAULT relates a remarkable case of this in a woman 20 years of age. Labour being slow and the pains absent, version and subsequently application of the forceps to the after-coming head were resorted to. The abdomen was still large, and twin pregnancy was diagnosed. The placenta not separating, the hand was introduced and it was removed, and in searching over the fundus an opening was found in its upper and median part. Then, he says, he found another cervix uteri projecting into the uterus, just as the cervix projects into the vagina. Through this a second fœtus was felt presenting by the shoulder. Version was performed, and a second fœtus weighing 9½ lbs., removed. By a subsequent more complete examination M. Perrault convinced himself "that there were really two superimposed uteri, each with its distinct neck, and that the two fœtuses could not even have had direct relations with one another during their intra-uterine life, the one being placed in an inferior, the other in a superior compartment." The patient died of puerperal fever, but no autopsy was allowed to clear up this apparently inexplicable case.—*Brit. and For. Med.-Chir. Rev.*, from *Lyon Médicale*, Aug. 31, 1873.

57. *Spurious Pregnancy with Labour.*—Dr. UNDERHILL reported the following curious case of this to the Obstetrical Society of Edinburgh, Jan. 28th, 1874. Previous to marriage the patient's (æt. 23) menses had been always

regular, painless, and lasted about four days. She was married in January last, menstruated in February as usual, and since then has seen a very small quantity of discharge every month or six weeks, seldom lasting more than a day, or being more than enough to stain one cloth. The discharges were not quite regular, and were sometimes accompanied by pain. In March, April, May, and June, she was sick, and vomited every morning, the sickness passing off about midday. From this time her belly began to swell, so that she several times found it necessary to let out her dresses. She has been feeling the movements of the child for several months, but does not know when she first felt them. Her breasts have also enlarged, but not very much.

On Nov. 13th Dr. U. was sent for in the morning and found her sitting up. "She said she had had pains off and on since the Monday, and had had a considerable 'show.' She also stated that the pains were coming on now about every ten minutes, had been bad all night, but were better in the morning.

"I was sent for again about 2 P. M., and found her lying on the bed undressed, and as I entered the room she was apparently in the middle of a violent expulsive pain. She was crying out lustily, and biting a handkerchief between her teeth to prevent her cries being heard, while at the same time she was pulling hard at a cloth attached to the bedpost by way of helping the pains. I was told that pains of similar severity were coming on every five minutes or oftener. She complained mostly of pain round the back and loins, and some little in her belly. I saw another pain very similar to the first I had seen, and then tried to make a vaginal examination, fully expecting to find labour well advanced. I found great difficulty in introducing my finger, owing to a most determined contraction of the thighs together, and as soon as I touched the vulva, she threw herself round on her back, struggling and shrieking loudly. She declared that the mere touching of the vulva gave her great pain in the back. The sphincter vaginae was in a condition of spasmodic contraction; but, by determined persistence, I at length managed to reach the os, and, to my surprise, found it quite virginal, small, round, and hard; the pelvic brim was not occupied by any swelling or hardness, but all the parts felt quite natural. In fact, neither pregnancy nor any condition of disease could be made out by the finger. On examining the abdomen, it was found to be moderately distended in its lower part, but not nearly large enough for a full-time pregnancy; it was resonant to percussion all over, but the tapping caused her to wince and cry out as if in pain. I then made gentle pressure towards the pelvic cavity, and while engaging the patient in conversation, pushed in my hand, so that I could feel the promontory of the sacrum, and satisfied myself that the cavity of the pelvis contained no tumour large enough to be felt from the outside. On examining the breasts, I found them full, but not hard, with a light-brown areola, but the nipples were small, and not puffy, or in any way resembling the nipple of pregnancy. I told her at once that she was not pregnant, and that the whole thing was a mistake; and afterwards, though she complained of soreness and pain round the back, she had no more of the imitative throes of labour.

"Thinking that there might be some vaginismus from the difficulty I had found in examining her, I asked her, and she stated that connection gave her great pain occasionally, but not always; and from her husband I learned that connection was perfect, and, as far as he knew, without any pain to her, and that at least she complained of none.

"The next day she was sitting up, the discharge still went on, but beyond a little soreness in the back, she was quite well. A dose of laudanum had given her a quiet night. Such are the facts of this case."

"The peculiarity of this case," Dr. U. remarks, "seems to be, that the patient is a young woman of good sense, and not at all of an hysterical character; that she was induced to believe in the existence of pregnancy by the opinion of her medical man, somewhat against her own judgment. She had some doubts about the pregnancy all the way through; that this notion had fixed itself in her mind; and that when a more than usually powerful stimulus to the sexual organs had arisen in the form of a delayed and, for her, unusually copious menstrual discharge, this notion had exploded in the pains of a simulated labour. The imitation of the labour-pains was very striking, the more so, as I found

subsequently that the patient had never seen a woman in labour. In the words of Hamilton, as quoted by Montgomery, 'She acquired the most accurate description of the breeding symptoms, and with wonderful facility imagined that she felt every one of them.'"

Dr. DUNCAN said he had seen many cases of spurious pregnancy, but only one of spurious labour. This was a lady who had borne five children previously. The menses had stopped, or rather, there was a scanty discharge, and at the wrong time. The abdomen was greatly distended. He received a pressing message to go to the lady, but being out of the way, a second most pressing one came. His diagnosis was, on examination, that the whole thing was a mistake—there was no pregnancy. The lady was quite incredulous. She was no novice, having borne five children previously; she knew the symptoms well. Still, as before said, there was no genuine pregnancy—no living product. This lady, Dr. Duncan added, kept up the delusion well, and made her friends believe that she had really given birth to a child, but that it was still-born. Dr. Underhill might have entered more profoundly into the interesting subject—and it was really interesting. There were various degrees of it. For example, there were some who merely exhibited the symptoms of pregnancy, and these symptoms never culminate in spurious labour. Were it not for the undoubted fact that some of the lower animals, such as bitches, exhibited spurious parturition, he would be inclined to deny it altogether. As it was, the thing could not be challenged—it was no mistake or delusion—at least, barring a few cases; but a reality, and, in fact, a disease. Dr. Duncan desired to emphasize that a distinction should be made betwixt those cases where there was merely spurious pregnancy—that was to say, where women fancied themselves pregnant—and those where this fancied pregnancy culminated in a fancied or spurious labour. Authors had not sufficiently attended to this distinction.—*Edinburgh Med. Journ.*, March, 1874.

58. *Post-partum Hemorrhage treated by the Application of the Solid Perchloride of Iron to the Interior of the Uterus.*—Dr. A. H. RINGLAND communicated to the Dublin Obstetrical Society, March 14th, a paper on this subject. Having referred to the arguments for and against the use of the perchloride of iron in cases of *post-partum* hemorrhage, and also to Dr. Barnes's admission, that in the fluid form, as he and others use it, the styptic may not be entirely free from danger, the author said that in the employment of iron in a different form from that hitherto recognized, he was indebted in a great degree to accident, and to the fertile ingenuity of Mr. Weir, the Resident Medical Officer of the Combe Lying-in Hospital. In an extern midwifery case, on which that gentleman and the author were in attendance, and in which the application of the perchloride of iron was immediately demanded, neither the solution, nor the necessary apparatus for its employment, was at hand. Mr. Weir, however, happened to have some of the solid salt with him, and he suggested the feasibility of introducing with the hand a small piece of the solid salt, and painting therewith the bleeding surface of the uterine cavity. It was at once so employed; the hemorrhage was instantaneously stayed, and the case terminated favourably. This occurred in October, 1871. So successful was the result thus obtained, that since January, 1872, in twenty-three cases in which the use of the perchloride of iron to the interior of the uterine cavity was absolutely necessary—out of a total of 4500 deliveries, three-fourths of which were extern—the same method was adopted. Dr. Ringland gave, in chronological order, the particulars of each case in which the styptic was thus used, from which statement it appeared that out of the twenty-three cases, fourteen recovered well; three made tedious recoveries (one patient being the subject of constitutional syphilis, and the other two being threatened with pelvic cellulitis). There were six deaths. Two cases died, one within two, and the other within three hours after delivery. One patient, in advanced pulmonary consumption, died on the ninth day from phlebitis; another death from pyæmia could be adequately accounted for by a portion of the placenta being morbidly adherent, which could not be removed. In the remaining two fatal cases, the placenta was also adherent, and death took place in each, apparently from sinking of the vital powers. No

post mortem could be obtained in any of the fatal cases. Dr. Ringland did not think that death could be fairly attributed to the use of the styptic in these cases. Out of the entire number (twenty-three), all, or at least a very large proportion of them, would have died, were it not for its employment; every means known to science having been previously adopted in each case respectively, but without avail. Every patient was running down rapidly, a fatal result appeared impending, and the styptic was only applied when the patient was almost *in extremis*; and yet, of the whole number, only four (excluding the first two cases) succumbed after its application. The first duty of a medical man, Dr. Ringland believed, was to tide over the immediate danger, irrespective of future contingencies; the more especially as such are, as demonstrated in the cases submitted, only exceptional, and when they do arise are in many instances amenable to treatment. The first pressing duty is to save the woman from dying. The case is, that other means being exhausted, she would die unless local styptics be applied. Where, then, is the force of the objection, that these styptics may do ulterior harm?

Dr. T. MORE MADDEN had injected the perchloride of iron in ten cases of *post-partum* hemorrhage, since January, 1870. He did not assert that this mode of arresting such hemorrhage was safe or efficacious in all cases; but it was more efficacious than any other remedy we possessed. Having referred to the advantages and disadvantages of the procedure, Dr. More Madden went on to give, in detail, the history of the cases in which he had used it. In nine cases the hemorrhage was arrested at once. In one case the injection failed. Seven of the cases recovered; three died, but death was in no way connected with the injection of the perchloride. He, Dr. Madden, considered that Dr. Snow Beck had fallen into the error of mistaking the *post hoc* for the *propter hoc*, as regards the occurrence of deaths consecutive to the injection of the perchloride of iron. Dr. Madden also thought that the remedy was often abused; and was of opinion that its use should be restricted to the treatment of those cases in which the ordinary hæmostatics had failed. In conclusion, Dr. More Madden referred to the practice of the Dublin School of Midwifery, in (1) the proper management of the second stage of labour; (2) the following of the uterus down with the hand; and (3) in giving ergot when the head was on the perineum, as being valuable means of obviating the tendency to *post-partum* hemorrhage.

Dr. M'CLINTOCK said that when this subject had been brought before the Society over three years ago by Dr. Roe, it had not assumed the great importance it now possessed. Ergot, cold, the internal and external manipulation of the uterus, and electricity, were all powerful agents in arresting *post-partum* hemorrhage. There were three important practical points connected with the use of the perchloride of iron, which recommended it to our notice. viz., (1) its feasibility; (2) its efficacy; and (3) its safety. Those cases in which there has been the largest losses of blood are the most likely to prove fatal; therefore, a fatal result should not always be attributed to the action of this styptic. The only case in which death could, he, Dr. M'Clintock, believed, be fairly set down as due directly to the remedy, was the case referred to by Dr. Bantock in the late discussion at the London Obstetrical Society, in which the iron was used, not to arrest, but in order to prevent hemorrhage. In this case the injection may have escaped into the peritoneal cavity, and have caused the intense pain which lasted until the patient's death. As to the solution used, he, Dr. M'Clintock, employed the liquor ferri perchloridi fortior, diluted with three or four parts of water, which was equivalent to the weaker fluid of the Pharmacopœia. Dr. A. H. Ringland's cases should be excluded from the category of cases under consideration, both on account of the remedy that was used, and the mode of using it. The introduction of the hand into the uterus was *per se* a most powerful means of stimulating that organ. Dr. M'Clintock had injected the perchloride of iron in four cases of *post-partum* hemorrhage. Three of these cases were successful. In the fourth case the hemorrhage was followed by appalling exhaustion, not proportionate to the amount of blood lost. The patient died three hours after delivery. If the uterus is occupied by clots, they should be removed before the injection is used, as otherwise the styptic cannot

come in contact with the bleeding surface. This was not sufficiently attended to in the last case, which, probably, was the reason why the injection, though repeated, did not succeed in arresting the flow of blood.—*Irish Hospital Gaz.*, April 1, 1874.

59. *Use of the Chloride of Iron in Post-partum Hemorrhage.*—Dr. LOMBE ATTHILL read before the Dublin Obstetrical Society, March 14, 1874, an interesting paper on this subject, and relates five cases in his private practice, in which he resorted to that mode of treatment, and makes the following comments on the class of cases in which the injection is most likely to be useful, and as to its subsequent effects on the patients:—

1. It is noteworthy that the only cases which seemed in my practice to demand this treatment were women in a previously bad state of health. Case No. I. was that of a lady who not only suffered from sickness to an excessive degree during pregnancy, but who for a long time previous to, and of course also during her pregnancy, consumed almost no food, and what she did take was of an improper character. No. II. was markedly anæmic. No. III. was in such bad health as to cause much alarm to her friends on this account prior to labour. Cases Nos. IV. and V. were the same patient. She, too, was on both occasions in a very bad state of health—so bad, indeed, that the induction of premature labour seemed more than once demanded. In all it may be fairly assumed that the blood was in an abnormal condition, probably destitute of its proper proportion of fibrine. This seems specially likely to have been so in Case II., in which, though the uterus contracted fairly, the hemorrhage continued.

2. As to the results: In three of the four patients pregnancy subsequently ensued; this fact proves clearly that the injection of the perchloride of iron in no way injured the uterus.

In four of these five cases, notwithstanding previous bad health and the great loss of blood sustained at the time, no unpleasant symptoms of any kind subsequently presented themselves. In one case death ensued. Taking into account her previous ill-health and the acknowledged tendency which always exists to the occurrence of peritonitis after excessive losses of blood, it hardly seems a reasonable inference that in her case death was due to the effects of the injection of the styptic. The Society have, however, before them all the facts which I am possessed of, for no *post-mortem* examination was possible. My own opinion is that this patient would probably have died whether the perchloride had been injected or not. Pyæmia, phlebitis, and peritonitis have, as is well known, carried off numbers of patients who have suffered from *post-partum* hemorrhage, long before the injection of a styptic for its arrest was proposed, the debility resulting from the loss favouring the occurrence of these forms of disease; and in the case of the patient under consideration, the state of her health previous to labour aggravated the danger, to which all cases of hemorrhage are liable. But even were it proved that her death was the result of the use of the perchloride, a further question has yet to be decided—namely this, believing as I did and still do, that this patient would have died from hemorrhage, and that in a few minutes, was I justified in using an agent which alone, in my opinion, was capable of saving her life? supposing it to be proved that in a certain proportion of cases the use of that remedy would be followed by fatal results.

This question seems to me to be identical with that which is involved in deciding on all capital operations, notoriously in that of ovariectomy, and that it must be decided on the same principles. I shall not, therefore, discuss it further.

For myself I have arrived at the following conclusions:—

1. That cases of *post-partum* hemorrhage occur in which the injection of the perchloride of iron, or some similar styptic, is alone capable of arresting the hemorrhage.

2. That the injection of such styptic does not necessarily increase the tendency which exists in such cases to the occurrence of pyæmia, septicæmia or peritonitis.

3. That this treatment is specially applicable to anæmic patients.

4. That while it should never be had recourse to unnecessarily, it should not, on the other hand, be delayed too long.

I may add that in using the solution of the perchloride of iron, I carry out in the main the directions given by Dr. Barnes. I have not, however, in any case injected more than six or eight ounces, sometimes as little as four ounces of the fluid. I also use it somewhat stronger than he does, namely, in the proportion of one part of the strong liquor, B. P., to two of water. The important point in using it is to take care that the end of the tube is passed up to the fundus of the uterus, and that the fluid be injected slowly. I should add that I have not met with any case in which the uterus did not immediately contract firmly on the perchloride being injected. I am inclined to attribute this to the fact that I had recourse to the remedy before the powers of the patient were so exhausted as to render the uterus incapable of responding to the stimulus.—*Dublin Med. Journ.*, April, 1874.

60. *Fatal Result of Injection into the Vagina.*—M. LORAIN records an interesting observation of an injection into the vagina followed by death. The patient was a young girl, sixteen years of age, who was suffering from vaginitis, probably of a blennorrhagic character. After an emollient treatment, consisting of baths and injections of decoction of marsh-mallow, as the surface of the vagina could not be painted with a brush filled with solution of nitrate of silver, M. Lorain gave directions that a weak solution of the nitrate should be injected. This was accordingly done at 10.30 in the morning, with a small syringe containing scarcely five centigrammes of the fluid. The quantity of the solution injected only contained one decigramme (1.54 grain) of the nitrate, and it was thrown in with due care. Violent pain was immediately experienced. The patient displayed the most marked agitation. Ice was applied over the belly and to the vagina. The temperature of the vagina was 37.8 C. The following day the temperature fell to 37.2, but vomiting occurred. On the three succeeding days the condition remained unchanged. Stomatitis then supervened, resembling closely that produced by mercury. On the fifth day after the injection death occurred suddenly at 7 P. M. M. Lorain attributes the accident to the penetration into the peritoneum of a few drops of the pus proceeding from the passages and Fallopian tubes consequent on the writhings produced by the pain. A post-mortem examination made by M. Tardieu showed that there was metritis with suppuration. The *tubæ* were filled with pus, some of which had flowed into the peritoneal cavity and produced a diffused peritonitis. M. Lorain cites a number of other cases in which a similar accident had happened. He thinks that every woman attacked with vaginitis, accompanied by symptoms showing that the ovaries and Fallopian tubes are affected, is in great danger. The care of the practitioner should be directed to the prevention of all excitement on the part of the patient. Pain should be allayed by opiates and by hypodermic injections, the bowels kept open by means of emollient injections and sitz baths, whilst the abdominal walls should be supported and rendered immovable by a corset of elastic collodion; and, finally, no examinations should be made beyond those that are absolutely required for the purposes of diagnosis.—*The Practitioner*, March, 1874, from *Bull. Gén. de Thérapeut.*, No. ii., 1874.

61. *Syphilis communicated by the Finger of a Midwife.*—M. BARDINET read a paper at a recent meeting of the Academy of Medicine which created a sensation. The following is a summary of the communication. Early in 1873 the town of Brive was in the enjoyment of a good sanitary condition, and the results of confinements being especially favourable, when it became known that some women recently delivered were the subjects of syphilitic symptoms, which were participated in by several of their husbands and infants, some of the latter dying in consequence. Discords arose in families that had borne unexceptionable characters. After a while it was discovered that all the women who had so suffered had been attended by the same midwife, and that this midwife had a bad finger, there being an ulcer at the edge of the nail, traces of which still

existed a twelvemonth afterwards. How this ulcer arose she could give no definite account, but some time after its appearance she became ill and emaciated, exhibited a scaly eruption, lost her hair and eyebrows, and suffered much from neuralgic pains. Shortly after her husband exhibited very similar symptoms. During eight months, between February 28 and October 29, fifteen women whom she attended became ill, to which number have to be added eight of their husbands and nine of their infants—*i. e.*, thirty-two individuals. This is, however, very far short of the entire number, the majority of the persons affected refusing to incur publicity by avowing the fact. From the inquiries which he made among the practitioners of the town, M. Bardinet believes that he is justified in considering the total of the cases to exceed one hundred. The practitioners of the place at once recognized the nature of the affection, and several of the persons affected pursued the midwife in a court of law. In March of the present year she was sentenced to two years' imprisonment and a fine of fifty francs.

M. Bardinet was employed by the court to examine into and report upon all the medical facts of the case. He found that towards the end of the first month after delivery, oftener during the second month, and sometimes during the third, a more or less abundant pustular eruption had appeared, commencing at the genital organs, and extending over the whole body. This was followed by lassitude, neuralgia, pains in the joints, desquamation of the palms of the hands and soles of the feet, and in almost all the cases great loss of hair. Among the husbands of these women, seven escaped contagion, but there is reason to believe that they had not cohabited with their wives; but the eight others, who had connection with their wives not long after delivery, exhibited well-marked syphilitic symptoms. Among the infants the eruption appeared in some at the end of a week, and in others at the latest before the end of the second. Of the fifteen infants of these women, nine suffered from the disease, and four of these died. In none of the cases observed was there either bubo or blenorragia present.—*Med. Times and Gazette*, May 25, 1874.

62. *Comparison between Hysterotomy and Ovariectomy.*—In a clinical lecture delivered at the Hôtel-Dieu M. RICHER drew a comparison between hysterotomy and ovariectomy. He pointed out that there was no relation between them in regard to their mortality; that in hysterotomy it was necessary to make the opening sufficiently large to permit the whole tumour to escape, whereas in ovariectomy, when no adhesions are present, a very small opening is all that is requisite to allow the cyst to be emptied and its collapsed walls to be drawn out. In hysterotomy the incisions must often extend from the pubis to the xyphoid cartilage. Hence the extremely dangerous nature of the operation. To diminish this danger it has been proposed to cut the uterus away piece by piece; but there is then the danger of fatal hemorrhage. Secondly, when the opening into the abdomen is made and the tumour has been removed, an extensive sutured wound remains, and the chances of evisceration are great, and it has actually happened in M. Richet's practice; and although in this instance the patient really died from pyæmia, the danger is not less real. The chief difficulty of the operation of hysterotomy is that of pediculating the tumour. In ovariectomy the walls of the cyst are often thin, and after the evacuation of the liquid a ligature can easily be applied; on the contrary, in hysterotomy the pedicle is often so large that it is often requisite to divide it into two parts, and ligature each half separately. It is necessary to tie the ligatures sufficiently tight to prevent hemorrhage; at the same time care must be taken not to lacerate the tissues, which are often sufficiently friable. After the ligature has been applied it remains to draw the pedicle to the surface, but the pedicle is inextensible, and in fact is directly continuous with the uterus. Hence for some time after the operation the patient experiences severe dragging pains in the pelvis, and sometimes it is absolutely necessary to relax the ligature and to remove the clamp. In ovariectomy it is possible to cause complete adhesion between the peritoneum and the pedicle; in hysterotomy this is not possible, and then a wall is formed from which it is requisite to remove the purulent

contents with the utmost care by frequent washing.—*Practitioner*, March, 1874, from *Le Progrès Méd.*, Jan. 10, 1874.

63. *On the Local Treatment of Gangrenous Vulvitis in Young Girls by Iodoform Powder.*—This serious affection is in some cases connected with convalescence from scarlatina, the sequelæ of a severe attack of fever, or some similar assemblage of unhealthy conditions affecting the whole of the organism. The younger Guersant and M. Trousseau have given some most useful counsels on this subject. After the indications given by the most powerful modifying agents, these two practitioners have not feared to have recourse to the disorganizing action of the actual cautery. This agent has, according to their experience, proved the least uncertain method of circumscribing the limits of the evil. MM. Rilliet and Barthez employed chloride of zinc for the same object, but these means are all very painful, and if, as it is affirmed in the *Progrès Médical*, M. PARROT, the surgeon to the Paris Children's Hospital, has succeeded in avoiding the disagreeable effects of this somewhat barbarous treatment, he will have effected great good. The topical application used at that establishment by the distinguished surgeon in question, is the iodoform powder, which is absolutely painless in use. During several years, M. Parrot has been tolerably successful in his treatment of ulcerated gangrenous vulvitis; combating it by the use of dressings of concentrated solution of chlorate of potash frequently renewed, or cauterizations with nitrate of silver. But neither of these methods, nor others needless to recapitulate, have been so uniformly successful as the iodoform. Iodoform alone, tried as a last resource after other topical applications, generally appeared to arrest the invading progress of ulcer in two or three days, and to rapidly facilitate the appearance of fleshy germs in the bottom of the wound. Iodoform in this case acts in the same way as in chancreous bubos, fungous ulcers, and hospital gangrene. But in order to attain the desired end the iodoform powder must be freely used; not the smallest portion of the wound must remain uncovered by it. When the bottom of the ulceration is very wet and the detritus plentiful, it is advisable to renew the dressing twice a day during the first two days.

The author of the article asserts that he has always very rapidly succeeded in modifying the appearance of these ulcerations by the use of this dressing, and even that he has so completely arrested their progress that none, which have been treated in the way indicated, have exceeded the size of a sixpence. It must also be noticed that this arrest of extension is accompanied by a rapid disappearance of the contiguous œdema, which raises the edges of the ulcerations and gives them a cup-like appearance.—*London Med. Record*, April, 1874.

64. *The Danger of Intra-Uterine Injections.*—The *Gazette de Joulin* gives the details of two cases, which show that while intra-uterine injections are energetic agents in modifying the conditions of this mucous cavity, they should be employed only with caution.

In one case, though the patient had become enfeebled by repeated hemorrhage, she endured, without suffering inconvenience, two injections of the uterine cavity. A third, consisting of a weak infusion of chamomile and diluted perchloride of iron, was succeeded by death in thirty hours, after decided symptoms of subacute peritonitis. The mucous lining of the uterus and right Fallopian tube, and the adjacent peritoneal surface, were found, after death, covered with an ink-black clot, and presenting unmistakable evidences of inflammation.—*Medical Examiner*, March 15, 1874.

AMERICAN INTELLIGENCE.

ORIGINAL COMMUNICATIONS.

Addendum to Art. IV. On Laparotomy as a Remedy in Cases of Intussusception, etc. By JOHN ASHHURST, Jr., M.D., etc.

Since my paper in the present number of the JOURNAL has been printed, the *Edinburgh Medical Journal* for June, and the last published volume (Vol. XIX., 3d Ser.) of the *Guy's Hospital Reports* have been received, and I find, in the former, a case of laparotomy for intussusception in a child five months old, terminating fatally on the second day, reported by Dr. John Duncan, and, in the latter, two cases of laparotomy for obstruction by a band—one fatal, one successful—reported by the operator, Mr. Howse, and a third case (fatal) of laparotomy for partial obstruction resulting from intestinal ulceration and omental adhesion, reported by the same gentleman as having occurred in the practice of Mr. Davies-Colley. This gives fourteen cases of laparotomy for intussusception, with five recoveries and nine deaths, or, if the cases recorded in this century only are considered, twelve with nine deaths, a mortality of 75 per cent. Adding Mr. Howse's three cases to the fifty-seven in the table (p. 61), we have a total of sixty cases of laparotomy for other causes than intussusception, with nineteen recoveries and forty-one deaths, a mortality of 68.33 per cent., or, including examples of intussusception, a grand total of 74 cases, with 24 recoveries and 50 deaths, a mortality of 67.57 per cent. In the *Lancet's* report of the discussion on Mr. Hutchinson's paper at the Royal Medico-Chirurgical Society of London (*Lancet*, Nov. 22, 1873, p. 738), Mr. Spencer Wells, after speaking of his published case of laparotomy for intussusception (*vide supra*, p. 57), is represented as having said that "he had operated upon other cases;" but the results are not given. This sentence does not occur in the reports furnished by the *Medical Times and Gazette* and the *British Medical Journal*. In the *Quarterly Summary* of the present number of this Journal (p. 265) will be found an interesting case in which a German surgeon, Dr. Betz, began, but did not complete, the operation of laparotomy, finding after the first incision had been made that it was possible to relieve the obstruction by external manipulation.

Epistaxis successfully Treated by Injections of Diluted Solution of the Subsulphate of Iron. By FRANKLIN N. STAUB, M.D., of Pittsburgh, Pa.

Mrs. K., æt. 75, retired to bed April 12th, complaining only of a feeling of weariness, no doubt dependent upon her old age. At ten o'clock the following morning, she was awakened by a discharge of blood from both nose and mouth, running in a continuous stream and almost choking her. The first hemorrhage was soon checked by administering common salt, in saturated solution, and afterwards giving her pills, composed of one quarter of a grain of opium and one grain of tannic acid.

The patient, a very active little woman, two days after (in opposition to my express injunctions to the contrary), went out walking. The same

night she again bled, had a recurrence of the epistaxis, which the family were able to check with the means previously used.

She had another recurrence of the hemorrhage the following afternoon, and for the first time fainted. I now tried the use of hot pediluvia, cold to the nape of the neck, and compression of the anterior nares; but none of the above means answered the purpose; I again tried to plug her nose, but found it impossible to do so, owing to the conformation of the posterior nares, pharynx, and posterior palatine arches, which were all small and contracted. The hemorrhage still continued, and I determined to test the efficacy of the officinal solution of the subsulphate of iron. I diluted the officinal solution with water, using the two in about equal proportions, and used an ordinary urethral syringe to inject into each nostril about one half ounce. The blood immediately coagulated on coming into contact with the solution, forming clots, which came away in the next two or three days, since which time there has been no loss of blood.

The entire quantity lost by the patient amounts to nearly sixty ounces (by measure), which, considering her great age, is an enormous quantity.

Podophyllin for Acute Rheumatism.—By R. F. DYER, M.D., of Ottawa, Ill.

About five years ago I accidentally discovered that the active principle of *Podophyllum peltatum* promptly relieved the pains in acute rheumatism. I usually follow it with the "alkaline treatment," and if the pains return recur again to the podophyllin. I commence with light doses combined with Dover's powder at intervals of two to four hours until the bowels are moved very freely several times, and have been frequently astonished at the amount required to effect this. In some cases I have given it in broken doses for three days before it took effect. The more severe the case the more it required. While the bowels could be acted upon easily by other remedies, the action of this was delayed. Sometimes two or three evacuations relieve; at others it requires eight or ten. After the bowels are evacuated, if relief is not obtained, I continue the use of the medicine in broken doses, not large enough to produce vomiting. If the pain returns in two or three days, I repeat the treatment. The iodide of potassium is a favourite remedy with me, combined with a syrup of *cimicifuga*. I have thought that perhaps it was the free purgation that afforded relief, but upon trying active catharsis from other remedies, I am fully satisfied that there is some specific influence exerted by the podophyllin. Having fully tested this remedy in the past five years, I now recommend it to the profession in all confidence, having given it in a large number of cases without a single failure in its affording relief from pain as soon as a free catharsis was produced.

DOMESTIC SUMMARY.

Traumatic Aneurism of Neck, Ligation of Left Common Carotid, with Permanent Silver Wire Ligature.—Dr. R. W. GIBBES, late Professor of Anatomy and Surgery in University of South Carolina, reports (*Charleston Med. Journ. and Rev.*, Jan. 1874) the case of a coloured man, aged forty, who was shot in the chin, Nov. 19, 1872.

Dec. 6th. Marked *fremissement* was observed over the whole left side, and there existed no doubt of formation of consecutive diffused aneurism. Left

arm almost completely paralyzed. On December 9th patient was operated upon, the usual incision being made along anterior border of sterno-mastoid muscle. The descendens noni was soon observed on anterior and inner surface of sheath, and drawn back by a blunt hook, as was also the internal jugular vein, which passed obliquely in front of the carotid below, and almost overlapped it at the omo-hyoid crossing. On opening the sheath, just above the omo-hyoid, and having the nerve and vein drawn well back, the pneumogastric was seen between the vessels, and posteriorly very deep. The artery was now raised on a grooved director, and the aneurism needle, armed with a small double silver wire, passed under it. The "bruit" heard under the stethoscope ceased immediately when the wire was drawn upon so as to occlude the canal. I then tied it in a common reef knot, cutting the ends off close, without having constricted the vessel sufficiently to divide either coat. The very short ends were turned against the vessel, or rather upon the constricting noose, and the wound closed by four silver wire stitches, including thickness of platysma myoides in each. Two strips of isinglass plaster were applied, and the upper part of wound covered with collodion.

I should have stated that close behind the upper end of my incision I found and removed a small piece, say about one-eighth, of the conical ball, which had been split off by the shattering of the bone, and is what was felt before the operation. The rest of it lies much deeper, and could not be found, it having injured not only the artery, but a part of the brachial plexus.

A director was now passed into the original wound, on side of chin, and a counter puncture made on neck, about two and a half inches under it, and one inch anterior to the superior angle of incision, a tent being introduced from below upward, on account of the suppuration connected with wound of maxilla.

One year after ligation patient was examined. The paralysis of right leg, the result of the operation, is much diminished, but still quite perceptible, and he walks well with a cane. The loss of power in the left arm (caused by the wound) is also somewhat improved. He uses it in eating, and in cutting wood, and can grasp one's hand pretty firmly in his palm, but not with ends of his fingers.

On applying the stethoscope a loud bellows sound is heard, occupying the whole left carotid region from sterno-clavicular junction to angle of maxilla, which ceases the instant that his head is extended, or his face slightly turned to the right, and also as soon as slight pressure is made on the vessel pulsating immediately behind the corner of the os hyoides. Whether this is the lingual or superior thyroid, I find myself unable to determine, although I think it is the latter. The carotid is felt pulsating strongly above the point of ligation, but below it appears as a firm cord, with only a slight impulse communicated to it from the arch of the aorta. I cannot feel the double constricting wire, but when the finger presses firmly on the spot, he says *he* feels it. I should have mentioned that the *bruit* is synchronous with the first beat of the heart, and extends over the second, masking it completely. No murmur can be heard on the right side of the neck, and none in the precordial region.

On the Spectrum of Bile.—Dr. J. C. DALTON recently read before the New York Academy of Medicine (*New York Med. Journ.*, June, 1874) a paper in which he discussed, first, the spectrum presented by fresh bile, which depends on the presence of its normal colouring matters; and, secondly, the spectrum presented by the coloured fluid of Pettenkofer's test, which depends for its production on the presence of the biliary salts.

Dr. Dalton gives the results of a series of observations on the spectroscopic characters of a number of different specimens of bile as follows:—

I. The spectrum of bile is characterized, as a general rule, by an absorption-band at C.

II. The existence and intensity of this band are proportional to the predominance of green in the colour of the bile.

III. The spectrum of the bile is also distinguished by a diminution or absence of the orange and yellow, and a corresponding extension of the red and green.

IV. There are sometimes also two other absorption-bands, comparatively uncertain and ill-defined, at D and at D 30 E.

V. The pure biliary salts in alcoholic solution, treated by Pettenkofer's test, give a spectrum with absorption-bands at E and F.

VI. In a watery solution, treated by the same test, they give a spectrum with but one absorption-band, namely, at E.

Treatment of Uterine Fibroid by Hypodermic Injections of Ergotine.—Dr. THEOPHILUS PARVIN records (*Am. Practitioner*, May, 1874) three cases of uterine fibroid, in which marked benefit followed the hypodermic administration of ergot. In all the cases heretofore treated, so far as Dr. Parvin knows, the ergotine has been administered with glycerine, which Dr. J. T. Bowls, of Knightstown, Ind., shows is a needless and may be injurious addition, causing in some cases painful inflammation and threatening abscesses, which was not observed when the glycerine was omitted, and the efficiency of the injection was not found to be lessened.

Dr. A. REEVES JACKSON reported to the Chicago Society of Physicians and Surgeons (*Chicago Med. Journ.*, June, 1874) five cases of fibrous tumour of the uterus treated by the method of Hildebrandt, and in three of them with decidedly favourable results.

Dr. Jackson obtained the best results from a solution prepared according to the following form: "Fifty grains of the extract (Squibb's) are dissolved in 250 minims of water, the solution filtered and made up to 300 minims, by passing water through the filter to wash it and the residue upon it. It represents ergot grain for minim, free from alcohol or other irritating substance."

Latterly he has used this solution exclusively, and thus far has seen no irritation, pain, or inflammation result from it.

He no longer selects the abdomen as the site for injection. Although some parts of the abdominal wall—as about the umbilicus, for example—may be less sensitive to puncture than others, yet all parts of it are more sensitive than the deltoid region; and inasmuch as the latter is more convenient, and the injections placed there equally efficacious, he now habitually selects the arm in preference to any other part of the body.

Another case was reported to the Society by Dr. J. H. ETHERIDGE, three by Dr. H. P. MERRIMAN, and one by Dr. S. FISHER, in all of which beneficial results followed the hypodermic use of ergotine.

Inversion of Uterus; Prompt Replacement.—Dr. G. W. H. KEMPER reports (*Indiana Journ. Med.*, March, 1874) an example of this in a woman aged 33, in her sixth labour. Fifteen minutes after the birth of the child, a violent pain came on which expelled the placenta beyond the vulva, and completely inverted the uterus. His first suspicion of an inversion was caused by the uterus escaping his grasp above the pubes, and disappearing into the pelvis.

"There was no unusual amount of hemorrhage, and her pulse was good. There was not the least tendency to shock, and the woman was not aware that anything unusual had occurred, until I began its reduction. Without waiting for chloroform or assistant, I hastily separated the placenta, which was adherent to the fundus, before attempting to replace the uterus. Pushing my right hand through the vulva into the vagina, while steadying the tissues above the pubes with my left, I indented the fundus with the tips of my fingers, and maintained a constant, steady pressure in the direction of the axis of the pelvis. In about five minutes my efforts were rewarded with success. I kept my hand in the uterus for a few moments and satisfied myself that every portion had been fully restored, and the outlines of the organ distinctly perceptible through the abdominal walls."

Dr. K. states that he had made but slight traction on the cord, not sufficient to cause the inversion.

Report on the Ovaries removed by Dr. Thomas.—In our preceding No., p. 577, we referred to the operation performed by Dr. T. G. Thomas for the removal of the ovaries. At the meeting of the New York Obstetrical Society,

February 17. Dr. NOEGGERATH read a detailed account of the macro- and microscopical examination of those ovaries. "The ovaries," he stated, "are of normal size, covered with numerous fine thread-like adhesions and filaments. Under the microscope both ovaries were found to be in a high degree of interstitial inflammation and fatty degeneration, the Graafian follicles partly obliterated and partly filled with hemorrhagic clots. A number of bodies similar to and probably Pacinian corpuscles, with what appeared to be nervous filaments leading to them, were found in the ovaries, from the whole appearance of which it was evident that no treatment short of removal would have been of service."

He attributes the constant and agonizing pain experienced by the patient in the ovaries not to the fatty degeneration, but principally to the inflammation of the peritoneal envelope of the organ and the consequent cicatricial contraction. This perimetritis may have been present since childhood, for he has seen a case in a child two and a half years of age.—*Am. Journ. of Obstet.*, May, 1874.

Bromide of Ammonium in Catamenial Excesses.—Dr. J. K. BLACK, of Newark, Ohio, has often tested the efficiency of this preparation in non-structural excesses, and he speaks (*Cincinnati Lancet and Observer*, May, 1874) with confidence of its valuable powers. He says he no more certainly anticipates the arrest of an attack of ague by the administration of quinia than does he anticipate the control of the forms of catamenial excess referred to, by the proper administration of the bromide of ammonium.

In the administration of the remedy an essential rule is, that its use shall precede the expected period by at least ten days. Its administration only during the crisis will do very little, if any, good. The sedative influence of the remedy must precede and accompany the stage of ovarian and uterine vascular engorgement, which itself preceded the flow by several days.

Some writers have spoken quite favourably of the remedy in dysmenorrhœa and menorrhagia, administered in the usual manner; that is, during the crisis only. Having been frequently called to see cases of these disorders during their progress, I have failed to observe any very satisfactory evidence of its controlling power while administered only during the emergency. But when administered according to the above directions, it has not only, almost without exception, lessened a regular monthly excess, but it has, in appropriate cases, in quite a number of instances which I can recall to memory, changed a two-week into a four-week crisis.

It is only necessary to say to the inexperienced practitioner, that any associated disorder, which has even a remote bearing upon the menstrual excess, should receive appropriate attention, else the controlling power of the bromide may be more or less uncertain or transitory in its beneficial effects.

Observations on the Normal Pulse, Respiration, and Temperature of Puerperal Women.—Dr. G. WILDS LINN, late Resident Physician to the Philadelphia Hospital, reports his temperature observations in a series of 24 normal puerperal cases occurring in the Philadelphia Hospital. The observations were begun immediately after delivery and continued for nine days, during which time the patients were kept in bed. The temperature was observed in the axilla at 9 A. M. and 8 P. M. While the cases were under observation no alcoholic stimulants were allowed. The diet consisted of milk, eggs, beef-tea, and mutton, with coffee or tea, and bread, toasted or plain, with butter.

The conclusions deduced from these observations are:—

1. That the normal temperature of the puerperal woman is only about $.6^{\circ}\text{F}$. higher than that of the healthy human being, if we accept the statement of Wunderlich, that the mean normal temperature is 98.6°F . ($= 37^{\circ}\text{C}$.).

2. That the normal pulse of the puerperal woman is not more frequent than that found under ordinary conditions in a state of perfect health.

3. That the number of respirations is increased if the statement of physiologists be received, that the number of respirations of the healthy woman ranges from 18 to 20 per minute.

4. That the generally received opinion that the secretion of milk is attended by an increase in temperature of one or more degrees, and an increase in the frequency of the pulse of 10 or 12 beats per minute, is erroneous.

5. That a temperature of 100°F. ($= 37.77^{\circ}\text{C.}$) or a pulse of 100 per minute in the lying-in woman is indicative of some pathological process which it behooves the accoucheur to discover at once, in order that proper measures may be taken to arrest its development and remove the evil.—*Philada. Med. Times*, May 9, 1874.

These observations are in accord with those previously published by Barker, Winkel, Wolff, and Baumfelden.

Hydro-chloral by the Rectum in the Vomiting of Pregnancy.—Dr. D. B. SIMMONS, Chief Surgeon to Ken Hospital, Yokahama, Japan, reports (*Medical Record*, June 1, 1874) four cases of excessive vomiting of pregnancy in which 30 grain doses of chloral morning and evening, administered in mucilage by the rectum, afforded marked relief.

Should another opportunity offer, writes Dr. Simmons, for a trial of this plan of treatment, we have decided to commence with larger doses, being convinced that a decided impression, produced by the medicine at first, will require its repetition but two or three times to put an end to the disease, for the time at least.

We believe that hydro-chloral, administered in this manner, will relieve most cases of nervous or sympathetic vomiting, where there is no inflammation especially. Even in strangulated hernia, on theoretical grounds, it ought to act well, not only in checking the vomiting, but in producing relaxation. We should give it a trial also in cholera.

Drainage in Obstinate Chronic Inflammation of the Bladder.—Dr. HUNTER McGUIRE reports (*Virginia Med. Monthly*) a case of "chronic inflammation, and probably ulceration of the bladder," of eight years' duration, successfully treated by drainage; but instead of effecting this by opening the vesico-vaginal septum, as done by Simpson, Emmet, and Parvin, he introduced a piece of gum tubing, the portion of which to be introduced into the bladder was perforated by a shoemaker's punch, with holes half an inch apart. A straight silver tube was first passed into the bladder, and the gum tubing introduced through it; the silver tube was then withdrawn, and the gum one secured in place, and the free end put into a bottle to catch the urine. A vaginal suppository of morphia and belladonna was introduced. The catheter was removed and cleaned, a new one substituted whenever necessary, and the vaginal suppository was also repeated every twelve hours. Afterwards Dr. McG. substituted a large silver catheter, nearly straight, with a large vesical opening for the gum tube. At the end of six weeks a gum bag was attached to the free end of the silver catheter, so as to allow the patient to get up and walk about. This treatment was continued for four months, when the tube was removed from the bladder. There was for some time afterwards incontinence of urine, but the bladder gradually regained its healthy power, and eight months after the commencement of the treatment the patient could retain her urine for about three hours, and void it without pain; and, except the increased frequency of micturition, which is growing less, the patient is reported to be well.

Restraint of Hemorrhage during Operation in the Mouth.—Prof. E. ANDREWS recommends (*Medical Examiner*, April, 1873) the following procedure, suggested to him by Dr. Ira Manly, of Markezan, Wis., to overcome the difficulties encountered from hemorrhage in operations in the mouth.

The patient being first etherized in the ordinary way, the mouth is held open by an instrument devised for the purpose by Prof. E., and then the spray from the ether spray apparatus is to be directed upon the roof of the mouth, but not with such intensity as to produce freezing. The cold thus produced contracts the vessels, so that Prof. E. was able to perform uranoplasty with comparatively little delay from hemorrhage, or accumulation of mucus. At the same

time the patient, constantly inhaling the spray, the anæsthetic was steadily maintained.

Surgical Treatment of Naso-pharyngeal Polypi.—Dr. DAVID W. CHEEVER states (*Boston Med. and Surg. Journ.*, June 4, 1874) that “after a thorough review of all the measures which have been adopted to remove naso-pharyngeal polypi, we feel justified in drawing the following conclusions:—

“1. The excision, partial or complete, of the upper jaw is applicable only to the removal of tumours which grow from, or are attached to, some portion of that bone.

“2. Tumours having their origin either in the sphenomaxillary fossa, the posterior nares, or the body of the occipito-sphenoid bone, can be attacked and completely removed by one of the operations for displacing the upper jaw, or the nose.

“3. In this second class of cases, to remove any portion of the bony structures of the face, when they are unaffected by disease and could be displaced and restored, is to cause a needless mutilation, and is contrary to sound principles of conservative surgery.

“4. For tumours in the sphenomaxillary fossa, Langenbeck's major operation is applicable.

“5. For the growths in the posterior nares and top of the pharynx, Ollier's operation by displacing the nose; or Huguier's operation, modified by us in keeping the vascular connection of the palate and pterygoid processes unbroken, will either of them prove sufficient to eradicate the disease.

“6. In very large tumours, there is no reason, *à priori*, why our operation of displacing the whole upper jaw should not succeed.”

The Influence of Anæsthetics on the Vaso-motor Centres.—In an interesting investigation on the influence of anæsthetics on the vaso-motor centres Dr. H. P. BOWDITCH and CHARLES S. MINOT, B.S., deduce (*Boston Med. and Surg. Journ.*, May 21, 1874) the following conclusion as possessing a high degree of probability:—

“While ether and chloroform resemble each other in their effect on those nervous centres whose activity is connected with the conscious perception of pain, the latter acts much more strongly than the former upon those centres which regulate the arterial blood-tension, and thus affects profoundly the conditions of animal life. Ether and chloroform are, therefore, both anæsthetics, but chloroform is, also, something more.”

Modification of Trommer's Test for Sugar.—Dr. GEORGE B. FOWLER made some interesting remarks before the Northwestern Medical and Surgical Society, New York (*N. Y. Med. Journ.*, June, 1874), relating to the various tests of urine, and particularly with reference to a modification of Trommer's test for sugar. In order to use this test, take one ounce of water and add to it one drop of honey; apply Trommer's test to a portion in a test-tube, and the chemical reaction will take place. Take one ounce of urine and add to it one drop or as much honey as you please; apply Trommer's test, and a transparent molasses-colour will result. Take the precipitated red oxide of copper which resulted in the watery solution in the first case and add boiling urine: the red precipitate will immediately disappear. The urine, therefore, possesses the property of dissolving the red oxide of copper, upon the appearance of which Trommer's test depends. But a certain quantity of urine can only dissolve a certain amount of the copper. So, if we add an excess of copper, this excess will be precipitated by the sugar, and the usual reaction will show itself. But when three or four drachms of urine are used, as is always the case, the quantity of potash solution which will have to be added in order to produce a clear blue colour will overrun an ordinary-sized test-tube. Therefore, take from five to ten drops of the suspected urine and add two or three drops of the sulphate of copper solution ($1\frac{3}{4}$ to $1\frac{3}{8}$). Then pour in the alkali until a transparent blue colour appears. Now boil, and the reaction will be perfectly distinct and satisfactory.

JEFFERSON MEDICAL COLLEGE.

PHILADELPHIA, PA.

The next annual session will commence on Monday, October 5th, 1874.
Preliminary Lectures from Monday, September 7th, 1874.

FACULTY.

JOSEPH PANCOAST, M.D., Emeritus.

S. D. GROSS, M.D., LL.D., D.C.L. Oxon., Surgery.

ELLERSLIE WALLACE, M.D., Obstetrics.

B. H. RAND, M.D., Chemistry.

J. B. BIDDLE, M.D., Materia Medica.

J. A. MEIGS, M.D., Institutes of Medicine.

J. M. DA COSTA, M.D., Practice of Medicine.

W. H. PANCOAST, M.D., Anatomy.

The Surgical Clinic will be under the charge of Professors JOSEPH PANCOAST, S. D. GROSS, and W. H. PANCOAST.

The Medical Clinic by Professors DA COSTA, RAND, BIDDLE, and MEIGS. Professors DA COSTA and MEIGS give clinical instruction at the Pennsylvania Hospital, in the immediate vicinity of the College.

The Clinic of Diseases of Women by Professor WALLACE.

The Eye and Ear Clinic by Drs. R. J. LEVIS and W. THOMSON, Surgeons to the Wills Hospital. Clinical Instruction is also given at the Philadelphia Hospital. The surgical staff of this hospital includes Professor PANCOAST, and Drs. JOHN H. BRINTON and F. F. MAURY, lecturers at the Jefferson College.

T. H. ANDREWS, M.D., Demonstrator of Anatomy.

J. EWING MEARS, M.D., Demonstrator of Surgery.

Subjects in the Dissecting Room are furnished *free of expense*, and there are no incidental charges.

Number of students last session, 473; of graduates, 151. Fees, full course, \$140; Matriculation fee (paid once only) \$5; Graduation fee, \$30.

J. B. BIDDLE, M.D.,

Dean.

THE
AMERICAN JOURNAL
OF THE MEDICAL SCIENCES
FOR OCTOBER 1874.

CONTRIBUTORS TO THIS VOLUME.

- JOHN ASHHURST, JR., M.D., *Surgeon to the Episcopal Hospital, Philadelphia.*
 SAMUEL ASHHURST, M.D., *Surgeon to Episcopal Hospital, Philadelphia.*
 J. F. BALDWIN, M.D., *of Columbus, Ohio.*
 R. M. BERTOLET, M.D., *of Philadelphia.*
 J. C. BISHOP, M.D., *of Middleport, Ohio.*
 CHALES S. BULL, M.D., *Assist. Surgeon to New York Eye and Ear Infirmary.*
 F. A. BURRALL, M.D., *of New York.*
 SAMUEL C. BUSEY, M.D., *Physician to the Children's Hospital, Washington, D.C.*
 EDWARD H. CLARKE, M.D., *Late Professor of Materia Medica in Harvard College.*
 O. COOLEY, M.D., *of Chicago, Illinois.*
 EDWARD CURTIS, M.D., *Professor of Materia Medica and Therapeutics in College of Physicians and Surgeons, New York.*
 LOUIS A. DUHRING, M.D., *Clin. Lect. upon Diseases of the Skin in Univ. of Penna.*
 R. F. DYER, M.D., *of Ottawa, Ill.*
 STUART ELDRIDGE, M.D., *In Charge of Imperial School of Medicine, Hokodate, Japan.*
 AUSTIN FLINT, M.D., *Professor of Principles and Practice of Medicine in Bellevue Hospital Medical College, New York.*
 EUGENE C. GEHRUNG, M.D., *of Denver, Colorado.*
 ALLAN McLANE HAMILTON, M.D., *Physician in Charge of New York State Hospital for Diseases of Nervous System.*
 ROBERT P. HARRIS, M.D., *of Philadelphia.*
 FRANCIS L. HAYNES, M.D., *of Philadelphia.*
 I. MINIS HAYS, M.D., *of Philadelphia.*
 ISAAC HAYS, M.D., *of Philadelphia.*
 ALBERT G. HEYL, M.D., *of Philadelphia.*
 CHARLES H. HUMPHREYS, M.D., *of Brandt, Ohio.*
 JAMES H. HUTCHINSON, M.D., *Physician to Pennsylvania Hospital, Phila.*
 B. J. D. IRWIN, M.D., *Surgeon and Brevet-Colonel U. S. Army.*
 A. F. A. KING, M.D., *Physician to Providence Hospital, Washington, D.C.*
 JOHN A. LIDELL, M.D., *of New York.*
 F. F. MAURY, M.D., *Surgeon to the Philadelphia Hospital.*
 WILLIAM MAY, M.D., *of Washington, D.C.*
 S. WEIR MITCHELL, M.D., *Physician to Infirmary for Nervous Diseases, Philadelphia.*
 THOMAS G. MORTON, M.D., *Surgeon to the Pennsylvania Hospital.*
 GEORGE A. MURSICK, M.D., *of Nyack, New York.*
 JOHN NELL, M.D., *Associate Professor of Clin. Surg. in Hospital of Univ. of Penna.*
 JOHN H. PACKARD, M.D., *Surgeon to the Episcopal Hospital, Philadelphia.*
 WILLIAM PEPPER, M.D., *Clinical Professor of Medicine in the University of Penna.*
 B. LINCOLN RAY, M.D., *of Philadelphia.*
 ISAAC RAY, M.D., *of Philadelphia.*
 JAMES C. REA, M.D., *Resident Phys. to Episcopal Hospital, Philadelphia.*
 JOS. G. RICHARDSON, M.D., *Lect. on Path. Anatomy in the Univ. of Penna.*
 D. B. ST. JOHN ROOSA, M.D., *Professor of Diseases of Eye and Ear in University of City of New York.*
 F. S. SHARPE, M.D., *of Natchez, Mississippi.*
 FRANKLIN N. STAUB, M.D., *of Pittsburgh, Pa.*
 THOMAS D. STRONG, M.D., *of Westfield, N.Y.*
 JOHN R. TAYLOR, M.D., *of Kosse, Texas.*
 F. S. THOMAS, M.D., *of Macedonia, Iowa.*
 A. VANDERVEER, M.D., *of Albany, New York.*
 W. H. WEBB, M.D., *of Philadelphia.*

TO READERS AND CORRESPONDENTS.

All articles intended for the *Original Department* of this Journal must be contributed to it *exclusively*. The insertion elsewhere of *abstracts* of papers prior to the publication of the entire paper in this Journal is a violation of this rule. As original articles are *accepted only on this condition*, we consider those who favour us with contributions to be bound in honour to conform to it.

Several original articles and bibliographical notices in type have been laid over for want of room. We ask the indulgence of our contributors, and assure them that their favours shall receive early attention.

Contributors who wish their articles to appear in the next number are requested to forward them before the 1st of November.

Compensation is allowed for original articles and reviews, except when illustrations or extra copies are desired. A *limited* number of extra copies (not exceeding *fifty*) will be furnished to authors, *provided the request for them be made at the time the communication is sent* to the Editors.

We expect to be able in our next number to lay before our readers a full account of malarial hæmaturia, with the results of careful microscopical and chemical examinations of the urine, etc.

The following works have been received:—

Ueber Zufälle nach Operationem an den Hamund Geschlechtsorganen. Von Dr. JOS. ENGLISH, Doc. fur Chir. an der Wiener Universität.

Recerche Intomo Alla Belharzia Hæmatobia in relazione Colla Ematuria Endemica dell' Egitto E Nota Intomo ad un Nematodeo trovato nel Sangue Umano Lavato del Dottor Prospero Sonsino.

Inspeccion General de las Oubrys y Dependencias de la Empresa de Aguas Corrientes Ordenada por la Junta Económico-Administrativa. Montevideo, 1874.

Quale Possa Essere il Farmaco Meglio Opportuno tanto a preverire quanto a Combattere I Morbo Pestilenziali. Lettera del Dottore Socrate Cadet.

Saint Thomas's Hospital Reports. New series. Edited by Dr. BRISTOWE, Dr. STONE, and Mr. CROFT. Vol. IV. London: J. & A. Churchill, 1873.

The Physiology of the Circulation in Plants, in the Lower Animals, and in Man. By J. BELL PETTIGREW, M.D., F.R.S. Illustrated by one hundred and fifty engravings on wood. London: Macmillan & Co., 1874.

On Mycetoma or the Pungus Disease of India. By H. VANDYKE CARTER, M.D., Lond., H. M. Indian Army. J. & A. Churchill, 1874.

An Inquiry into the Value of the Signs and Symptoms regarded as diagnostic of Congenital Syphilis in the Infant. By THOMAS BALLARD, M.D. London: J. & A. Churchill, 1874.

The Period of Infection in Epidemic Disease. By WILLIAM SQUIRE, M.D. London: J. & A. Churchill, 1874.

On the Hours of Maximum Mortality in Acute and Chronic Diseases. By JAMES FINLAYSON, M.D. Glasgow, 1874.

Electro-Therapeutics: A Condensed Manual of Medical Electricity. By D. F. LINCOLN, M.D., Phys. to the Dept. of Diseases of the Nervous System, Boston Dispensary. Philadelphia: Henry C. Lea, 1874.

Essays on Conservative Medicine and Kindred Topics. By AUSTIN FLINT, M.D., Prof. of Prin. and Prac. of Med., and Clinical Med., in Bellevue Hosp. Med. Coll., New York. Philadelphia: Henry C. Lea, 1874.

A Practical Treatise on the Diseases of Women. By T. GAILLARD THOMAS, M.D., Prof. of Obstetrics and Dis. of Women and Children in Coll. of Phys. and Surgeons, New York, etc. Fourth ed., thoroughly revised. Philadelphia: Henry C. Lea, 1874.

A Complete Handbook of Obstetric Surgery: or Short Rules of Practice in every emergency from the simplest to the most formidable operations connected with the science of Obstetrics. With numerous illustrations. By CHARLES CLAY, M.D., late Sen. Surgeon and Lect. on Midwifery, St. Mary's Hosp., Manchester, etc. From the third London ed. Philadelphia: Lindsay & Blakiston, 1874.

Surgical Emergencies; together with the Emergencies attendant on Parturition and the treatment of Poisoning. A Manual for the use of general practitioners. By WILLIAM PAUL SWAIN, F.R.C.S., Surgeon to the Royal Albert Hospital, Devonport. Philadelphia: Lindsay & Blakiston, 1874.

Cocain, Veratria, and Gelseminum, Toxicological Studies. By J. OTT, Easton, Penna. Philadelphia: Lindsay & Blakiston, 1874.

Transactions of the Pathological Society of Philadelphia. Vol. IV. Edited by JAMES TYSON, M.D., Recorder of the Society. Philadelphia: J. B. Lippincott & Co., 1874.

The Physiology of Man; designed to represent the existing state of Physiological Science, as applied to the Functions of the Human Body. By AUSTIN FLINT, JR., M.D., Prof. of Physiology and Phys. Anat. in the Bellevue Hospital Med. Coll., New York, etc. etc. Vol. V. Special Senses, Generation. New York: D. Appleton & Co., 1874.

The Medical Register and Directory of the United States. By SAMUEL W. BUTLER, M.D. Philadelphia, 1874.

Nomenclature of Diseases prepared for the use of the Medical Officers of the U. S. Marine Hospital Service by the Supervising Surgeon (JOHN M. WOODWORTH, M.D.). Being the classification and English-Latin Terminology of the Provisional Nomenclature of the Royal College of Phys., London. Washington, 1874.

Diseases of the Conjunctiva. By DUDLEY S. REYNOLDS, M.D. Louisville, 1874.

Recent Advances in the Diagnosis of Diseases of the Nervous System. By HORATIO R. BIGELOW, M.D., of Hartford, Conn. Detroit, 1874.

A Case of Anchylosis of the Right Temporo-Maxillary Articulation, successfully treated by Excision of the Condyle; with remarks by JAMES L. LITTLE, M.D., Surgeon to St. Luke's Hospital. Albany, 1874.

Clinical Report of the Lying-in Service at Bellevue Hospital for the year 1873. By WILLIAM T. LUSK, M.D., Prof. of Obstet. and Dis. of Children in Bellevue Hosp. Med. Coll. New York, 1874.

The Relation of Medical Societies to Progress in Science. By ALEX. J. C. SKENE, M.D. Brooklyn, 1874.

Catalogue of the Specimens in the Pathological Museum of the Philadelphia Hospital. Prepared by JAMES TYSON, M.D., one of the Attending Physicians and Pathologist to the Hospital; assisted by R. M. BERTOLET, M.D., Microscopist to the Hospital. Philadelphia, 1874.

Medical Literature of Kentucky. By LUNSFORD P. YANDELL, M.D. Louisville, 1874.

Inorganic Cardiac Murmurs. By A. T. KEYT, M.D., of Cincinnati.

Divulsion in Stricture of the Urethra. By SAMUEL LOGAN, M.D., Prof. of Anat. and Clin. Surgery, Univ. of La.

A New Method of treating Malignant Tumours by Electrolyzing the Base. By GEORGE M. BEARD, A.M., M.D.

Psychical or Physical. By C. H. HUGHES, M.D., St. Louis.

Atmospheric Electricity and Ozone; their relation to Health and Disease. By GEORGE M. BEARD, M.D. New York, 1874.

On Strain and Over-Action of the Heart. By J. M. DA COSTA, M.D., Prof. of Prac. of Med in Jefferson Med. Coll., Phila. Toner Lecture delivered May 14, 1874. Washington: Smithsonian Institution, Aug. 1874.

The Yellow Fever Epidemic of 1873. The White Blood-Corpuscle. By JEROME COCHRAN, M.D., Professor of Public Hygiene and Med. Jurisp. in Med. Coll., Ala. Montgomery, 1874.

Address of Joseph M. Toner, M.D., President of the American Medical Association. Philadelphia, 1874.

Report of the Board of Health of the City and Port of Philadelphia, 1873.

Report of the Board of Health of the City of Boston, 1874.

Proceedings of the Academy of Natural Sciences of Philadelphia. Jan., Feb., March, 1874.

Transactions of the Kentucky State Medical Society. Louisville, 1874.

Transactions of the Medical Society of the District of Columbia. Washington, 1874.

- Transactions of the Medical Association of Missouri, 1874. Kansas City, 1874.
 Transactions of the Medical Society of California, 1873-1874. Sacramento, 1874.
 Transactions of the South Carolina Medical Association, 1874. Charleston, 1874.
 Transactions of the Medical and Chirurgical Society of the State of Maryland, 1874. Baltimore, 1874.
 Transactions of the Medical Society of the State of West Virginia. Wheeling, 1874.
 Transactions of the Medical Society of the County of Albany, from 1851 to 1870. Albany, 1872.
 Transactions of the Clinton District Medical Society of the State of Missouri. Mexico, Mo., 1874.

The following Journals have been received in exchange:—

- Kin-Se I-Setzu. Nos. 1 and 2. Japan, 1874.
 Deutsches Archiv für Klinische Medicin. Bd. xiii. Heft 4, 5, 6. Bd. xiv. Heft 1.
 Archiv für Anatomie, Physiologie, und Wissenschaftliche Medicin. 1873, Nos. 5, 6, and No. 1, 1874.
 Centralblatt für die Medicinischen Wissenschaften. Nos. 29 to 41, 1874.
 Allgemeine Wiener Medizinische Zeitung. Nos. 24 to 35, 1874.
 Archiv der Heilkunde, 1874, 3 and 4 heft.
 Nordiskt Medicinskt Arkiv, 1874. Andra Häftet.
 Giornale Italiano delle Malattie Veneree e della pelle. Giugno, 1874.
 L'Imparziale. Nos. 12, 15, 16, 1874.
 O Correio Medico de Lisboa. Nos. 16, 17, 18, 19.
 Lo Sperimentale. Fascic. 5, 6, 1874.
 Archives Générales de Médecine. Juillet, Aout, Septembre, 1874.
 Annales de Dermatologie et de Syphiligraphie. Tom. v. No. 5.
 Revue des Sciences Médicales en France et de l'Etranger. Juillet, 1874.
 Gazette Hebdomadaire de Médecine et de Chirurgie. Nos. 25 to 36, 1874.
 L'Union Médicale. Nos. 72 to 107, 1874.
 Le Mouvement Médical. Nos. 24 to 36, 1874.
 La Tribune Médicale, Nos. 304 to 316, 1874.
 Le Progrès Médical, Nos. 21 to 35, 1874.
 The Retrospect of Medicine. January-June, 1874.
 The British and Foreign Medico-Chirurgical Review. July, 1874.
 The Lancet. July, Aug., Sept., 1874.
 The Medical Times and Gazette. July, Aug., Sept., 1874.
 The British Medical Journal. July, Aug., Sept., 1874.
 The London Medical Record. July, Aug., Sept., 1874.
 The Practitioner. July, August, September, 1874.
 Edinburgh Medical Journal. July, August, September, 1874.
 The Journal of Anatomy and Physiology. Nov., 1873. May, 1874.
 The Dublin Journal of Medical Science. May, June, July, August, 1874.
 The Sanitary Record. July, August, September, 1874.
 Irish Hospital Gazette. July, August, September, 1874.
 The Glasgow Medical Journal. July, 1874.
 The Indian Medical Gazette. June, July, August, 1874.
 Canada Medical and Surgical Journal. July, September, 1874.
 The Canada Lancet. July, August, Sept., 1874.
 The Canada Medical Record. June, July, August, September, 1874.
 The Obstetrical Journal of Great Britain and Ireland. With an American Supplement. July, August, September, 1874.
 The Boston Medical and Surgical Journal. July, August, September, 1874.
 The New York Medical Journal. July, August, September, 1874.
 The Medical Record. July, August, September, 1874.
 The American Journal of Insanity. July, 1874.
 The American Journal of Syphilography and Dermatology. July, 1874.
 The American Journal of Obstetrics. August, 1874.
 The Buffalo Medical Journal. June, July, 1874.
 The Psychological and Medico-Legal Journal. July, August, September, 1874.
 The Philadelphia Medical Times. July, Aug., Sept., 1874.
 The Medical and Surgical Reporter. July, Aug., Sept., 1874.
 Half-Yearly Compendium of Medical Science. July, 1874.
 Archives of Ophthalmology and Otology, Vol. iv. No. 1.
 The Cincinnati Lancet and Observer. July, Aug., Sept., 1874.

The Cincinnati Medical News. July, August, September, 1874.
 The Clinic. July, Aug., Sept., 1874.
 The American Practitioner. July, Aug., Sept., 1874.
 The Medical Examiner. July, Aug., Sept., 1874.
 The Chicago Medical Journal. July, August, 1874.
 The Indiana Journal of Medicine. July, August, September, 1874.
 The Detroit Review of Medicine and Pharmacy. July, Aug., Sept., 1874.
 The St. Louis Medical and Surgical Journal. July, Aug., Sept., 1874.
 The Missouri Clinical Record. July, Aug., Sept., 1874.
 The Northwestern Med. and Surg. Journal. June, 1874.
 The Medical Herald. July, August, 1874.
 The Kansas City Medical Journal. July, August, September, 1874.
 The Peninsular Journal of Medicine. July, Aug., Sept., 1874.
 The Pacific Medical and Surgical Journal. July, August, September, 1874.
 The Western Lancet. June, July, August, 1874.
 The Chicago Journal of Nervous and Mental Diseases. July, 1874.
 Virginia Medical Monthly, July, August, September, 1874.
 Charleston Medical Journal and Review. July, 1874.
 The Southern Medical Record. June, July, 1874.
 Atlanta Medical and Surgical Journal. July, August, 1874.
 The New Orleans Medical and Surgical Journal. July, September, 1874.
 The Richmond and Louisville Medical Journal. July, August, 1874.
 The Nashville Journal of Medicine and Surgery. June, July, Aug., Sept., 1874.
 Baltimore Physician and Surgeon. July, August, September, 1874.
 The Sanitarian. July, Aug., Sept., 1874.
 The American Journal of Pharmacy. July, Aug., Sept., 1874.
 The Druggist's Circular. July, Aug., Sept., 1874.
 The Journal of Materia Medica. June, July, August, 1874.
 The Pharmacist. August, September, 1874.
 The Dental Cosmos. July, August, September, 1874.
 The American Journal of Dental Science. July, August, September, 1874.
 New Remedies. July, 1874.
 Archives of Electrology and Neurology. May, 1874.
 The American Journal of Science and Arts. July, Aug., Sept., 1874.
 The American Naturalist. July, Aug., Sept., 1874.
 The American Chemist. June, July, 1874.
 The Boston Journal of Chemistry. September, 1874.

Communications intended for publication, and books for review, should be sent *free of expense*, directed to ISAAC HAYS, M.D., Editor of the American Journal of the Medical Sciences, care of Mr. Henry C. Lea, Philadelphia. Parcels directed as above, and (carriage paid) under cover, to Mr. Charles J. Skeet, Bookseller, No. 10 King William Street, Charing Cross, London: or M. Hector Bossange, Lib. quai Voltaire, No. 11, Paris, will reach us safely and without delay.

All remittances of money and letters on the *business* of the *Journal* should be addressed *exclusively* to the publisher, Mr. H. C. Lea, No. 706 Sansom Street.

The advertisement sheet belongs to the business department of the *Journal*, and all communications for it must be made to the publisher.

CONTENTS

OF THE

AMERICAN JOURNAL

OF THE

MEDICAL SCIENCES.

NO. CXXXVI. NEW SERIES.

OCTOBER 1874.

ORIGINAL COMMUNICATIONS.

MEMOIRS AND CASES.

ART.	PAGE
I. On the Local Treatment of Pulmonary Cavities by Injections through the Chest-wall. By William Pepper, M.D., Clinical Professor of Medicine in the University of Pennsylvania.	313
II. Post-Paralytic Chorea. By S. Weir Mitchell, M.D., of Philadelphia.	342
III. Trembling and Loss of Co-ordinating Motor Power, as Symptoms of Nervous Disease. By Allan McLane Hamilton, M.D., of New York.	352
IV. Historical and Analogical Record of the Siamese Twins. By Robert P. Harris, M.D., of Philadelphia. (With a wood-cut.)	359
V. A Contribution to the Etiology of Diseases of the Internal Ear. By D. B. St. John Roosa, M.D., Professor of Diseases of the Eye and Ear in the University of the City of New York, Surgeon to the Manhattan Eye and Ear Hospital. Read before the Society of Neurology and Electrology, April 20, 1874.	377
VI. Case of Aneurism of the Thoracic Aorta of long standing; gradually perforating the sternum, the orifice being plugged by a large clot which admitted of oozing and hemorrhage. Observed in the Medical Clinic of Prof. Da Costa, at Jefferson Medical College. Reported by W. H. Webb, M.D. (With four wood-cuts.)	400
VII. The Relation of Ozone to Disease. By J. F. Baldwin, A.M., M.D., of Columbus, Ohio.	416
VIII. On the Use of Chloral in Cases of Phthisis. By Francis L. Haynes, M.D., of Philadelphia.	428
IX. Case of Osteophytic Inflammation of the Right Radius: Resection; Preservation of a Useful Hand. By B. J. D. Irwin, M.D., Surgeon and Brevet Colonel U. S. Army. (With a wood-cut.)	429
X. Case of Dactylitis Syphilitica in a Child 18 months old. By Samuel C. Busey, M.D., Physician in Charge of Diseases of Children at the Columbia Hospital Dispensary, and one of the Physicians to the Children's Hospital, Washington, D. C. (With a wood-cut.)	434

ART.

PAGE

- XI. Case of Retinal Separation in the Right Eye and Amaurosis Uræmica in the Left, occurring simultaneously. By Albert G. Heyl, M.D., of Philadelphia. 437
- XII. Case of Habitual and Excessive Constipation; Eight Months and Sixteen Days between Fecal Evacuations. By Thomas D. Strong, M.D., of Westfield, N. Y. 440
- XIII. Two Cases of Bi-lateral Lithotomy. Reported by Wm. May, M.D., of Washington, D. C. 442
- XIV. Case of Double Uterus and Vagina; Division of Vaginal Septum. By Eugène C. Gehrung, M.D., of Denver, Colorado. 445

REVIEWS.

- XV. A Treatise on Food and Dietetics, Physiologically and Therapeutically considered. By F. W. Pavy, M.D., F.R.S.; Fellow of the Royal College of Physicians; Physician to and Lecturer on Physiology at Guy's Hospital. 8vo. pp. 574. Philadelphia: Henry C. Lea, 1874. 447
- XVI. A Manual of Psychological Medicine, containing the Lunacy Laws, the Nosology, Ætiology, Statistics, Description, Diagnosis, Pathology, and Treatment of Insanity, with an Appendix of Cases. By John Charles Bucknill, M.D. Lond., F.R.S., F.R.C.P., Lord Chancellor's Visitor of Lunatics; and by Daniel Hack Tuke, M.D., Member of the Royal College of Physicians of London, etc. Third Edition. Revised, Illustrated, and much Enlarged. 8vo. pp. 824. London: J. & A. Churchill, 1874. 459

ANALYTICAL AND BIBLIOGRAPHICAL NOTICES.

- XVII. Medico-Chirurgical Transactions. Published by the Royal Medical and Chirurgical Society of London. Volume the Fifty-sixth. 8vo. pp. lxxviii., 492. London: Longmans, Green, Reader, & Dyer, 1873. 469
- XVIII. Saint Bartholomew's Hospital Reports. Edited by Dr. Andrew and Mr. Callender. Vol. IX. 8vo. pp. xlv., 258; x., 81. London: Longmans, Green & Co., 1873. 485
- XIX. Transactions of American State Medical Societies.
1. Transactions of the Kentucky State Medical Society, 1874. Nineteenth Annual Session. 8vo. pp. 263.
 2. Transactions of the Minnesota State Medical Society, 1874. 8vo. pp. 86.
 3. Transactions of the Medical Society of the District of Columbia. Nos. I. and II., April and July, 1874. 8vo. pp. 24 each.
 4. Transactions of the South Carolina Medical Association. Annual Session, held April 14th and 15th, 1874. 8vo. pp. 124.
 5. Transactions of the Medical Society of California during the years 1873 and 1874. 8vo. pp. 152.
 6. Transactions of the Eighth Annual Meeting of the Medical Association of the State of Missouri, April, 1874. 8vo. pp. 63. 495
- XX. The Toner Lectures. Lecture III. On Strain and Over-Action of the Heart. By J. M. Da Costa, M.D., Professor of the Practice of Medicine in Jefferson Medical College, etc. Delivered May 14, 1874. 8vo. pp. 28. Washington: Smithsonian Institution, 1874. 504
- XXI. Essays on Conservative Medicine and Kindred Topics. By Austin Flint, M.D., Professor of the Principles and Practice of Medicine, and of Clinical Medicine, in Bellevue Hospital Medical College, New York. 12mo. pp. 214. Philadelphia: Henry C. Lea, 1874. 505
- XXII. On the Origin and Development of the Coloured Blood-Corpuscles in Man. By Dr. H. D. Schmidt, New Orleans, La. Read before the Royal Microscopical Society (London), January 7, 1874. Reprint from the Monthly Microscopical Journal, of London, February 1, 1874. 8vo. pp. 23. 507

ART.

PAGE

XXIII. Electro-Therapeutics.

1. Electro-Therapeutics: A Condensed Manual of Medical Electricity. By D. F. Lincoln, M.D., Physician to the Department of Diseases of the Nervous System, Boston Dispensary. Philadelphia: Henry C. Lea, 1874.
 2. Clinical Researches in Electro-Surgery. By A. D. Rockwell, A.M., M.D., Fellow of the New York Academy of Medicine, Electro-Therapist to the New York State Woman's Hospital; and George M. Beard, A.M., M.D., Fellow of the New York Academy of Medicine, Electro-Therapist to the Demilt Dispensary. New York: William Wood & Co., 1873.
 3. Treatment of Nervous-Rheumatic Affections by Static Electricity. By Dr. A. Arthius. Translated from the French by J. H. Eldridge, M.D., Professor of General Therapeutics, Rush Medical College, Chicago. Chicago: W. B. Keen, Cooke & Co., 1874. 508
- XXIV. Report of the Board of Health of the City and Port of Philadelphia, to the Mayor, for the year 1873. 8vo. pp. 255. 509
- XXV. On Hospitalism and the Causes of Death after Operations. By John Eric Erichsen, F.R.C.S., etc. Small 8vo. pp. viii., 107. London: Longmans, Green & Co., 1874. 512
- XXVI. Recent Works on Cholera.
1. Report on the Cholera Epidemic of 1872, in Northern India. By J. M. Cunningham, M.D., Sanitary Commissioner with the Government of India. Quarto pp. 150. Calcutta: Office of the Superintendent of Government Printing, 1873.
 2. A Report of Microscopical and Physiological Researches into the Nature of the Agent or Agents producing Cholera. By T. R. Lewis, M.B., Assistant Surgeon H. M. British Service; and D. D. Cunningham, M. B., Assistant Surgeon H. M. India Service, attached to the Sanitary Commissioner with the Government of India. 8vo. pp. 112. Calcutta: Office of the Superintendent of Government Printing, 1872.
 3. Observations on the Pathology and Treatment of Cholera. The Result of forty years' Experience. By John Murray, M.D., Inspector-General of Hospitals, late of Bengal. 12mo. pp. 58. London: Smith, Elder & Co., 1874.
- The same. New York: G. P. Putnam's Sons, 1874. 513
- XXVII. History of the American Ambulance established in Paris during the Siege of 1870-71, together with the Details of its Methods and its Work. By Thomas W. Evans, M.D., D.D.S., Ph.D., etc. London: Printed for the author at the Chiswick Press, and published by Sampson Low, Marston, Low & Searle, 1873. Imperial 8vo. pp. xxxviii., 694 521
- XXVIII. Lessons on Laryngoscopy; including Rhinoscopy and the Diagnosis and Treatment of Diseases of the Throat. By Prosser James, M.D., M.R.C.P., Lecturer on Mat. Med. and Therapeutics at the London Hospital, Physician to the Hospital for Diseases of the Throat, etc. 12mo. pp. 176. London: Baillière, Tindall & Cox, 1873. 523
- XXIX. Ligation of Arteries. By Dr. L. H. Farabeuf, Aide d'Anatomie à la Faculté, etc. Translated by John D. Jackson, M.D., of Danville, Kentucky. With engravings. 12mo. pp. 157. Philadelphia: J. B. Lippincott & Co., 1874. 523
- XXX. Skin Diseases; an Inquiry into their Parasitic Origin, and Connection with Eye Affections; also the Fungoid or Germ Theory of Cholera. By Jabez Hogg, Surgeon to the Royal Westminster Ophthalmic Hospital, etc. etc. 12mo. pp. 108. London: Baillière, Tindall & Cox, 1873. 524
- XXXI. Kin-Se I-Setzu. Modern Medical News. Edited by Stuart Eldridge, M.D. (U.S.). In charge of the Government Medical School, Hakodate. Nos. 1 and 2, for March and May, 1874. Yeddo, Japan. 526

QUARTERLY SUMMARY

OF THE

IMPROVEMENTS AND DISCOVERIES IN THE MEDICAL SCIENCES.

ANATOMY AND PHYSIOLOGY.

	PAGE		PAGE
1. Transfusion with the Blood of Different Animals. By Prof. Landois.	527	4. On Apnoea and its Influence on Convulsions. By Dr. W. Fillehne.	530
2. Electrical Stimulation of the Cerebral Convulsions. By Dr. Burdon Sanderson.	529	5. Cause of Death after Varnishing Animals. By Dr. Feinberg.	530
3. Injury to the Brain with Pulmonary Hemorrhage. By H. Nothnagel.	529	6. On the Alkalinity of Urine. By V. Feltz and E. Riter.	531

MATERIA MEDICA, GENERAL THERAPEUTICS, AND PHARMACY.

7. Experiments on the Elimination of Alcohol from the Body. By Dr. Anstie.	531	uanha administered as an Injection. By M. H. Chouppe.	536
8. Action of Chloral on the Blood. By Drs. Feltz and Riter.	533	14. On the Action of Bromide of Potassium. By Profs. Binz and Tommasi.	536
9. Physiological Action of Chloral and Bromal Hydrates and Iodoform. By Dr. McKendrick.	534	15. Physiological and Therapeutical Researches on the Monobromide of Camphor. By Dr. Bourneville.	537
10. Injection of Chloral into the Veins. By M. Vulpian.	534	16. Apomorphia as an Expecto- rant. By Dr. Jurasz.	537
11. The Diuretic Action of Digitalis. By Dr. Brunton and Mr. Henry Power.	534	17. Subcutaneous Injection of Hydrochlorate of Morphia. By M. Chouppe.	537
12. Therapeutical Action of Quinia. By M. Sée.	535	18. Valerianate of Amyl. By Dr. W. F. Wade.	537
13. Therapeutic Value of Ipecac-			

MEDICAL PATHOLOGY AND THERAPEUTICS, AND PRACTICAL MEDICINE.

19. Aphasia. By M. Ch. Richet.	538	Blood Cells in Septicæmia and Fever. By Arnold Hiller.	541
20. Pulsation of the Subclavian as a Sign of Superior Dilatation of the Aorta. By Dr. A. Fauvre.	539	24. Diphtheritic Paralysis. By Sir John Rose Cormack.	542
21. Aneurisms developed upon Branches of the Pulmonary Artery, bordering upon Cav- erns.	540	25. Diphtheria. By Mr. T. Prangley and Sir John Cormack.	542
22. Gerhardt's Percussion-Sign of Change of Pitch. By Dr. A. Weil.	541	26. Croton-Chloral in Certain Forms of Megrim. By Dr. Sidney Ringer.	543
23. Changes in Shape of the Red		27. Subcutaneous Injection of Chloral in Spasmodic Asthma. By Surgeon Major Baillie.	544
		28. Atropia in Phthisical Sweat-	

	PAGE		PAGE
ing. By Dr. Jas. M. William-son.	544	31. On Acute Rheumatism treated by Chloral Hydrate. By Staff-Surgeon A. Irwin.	546
29. Hydrophobia treated by the Intravenous Injections of Chloral. By M. Bucquoy.	545	32. Effect of Warmth in preventing Death from Chloral. By Dr. T. Lauder Brunton.	547
30. Treatment of Cholera by Subcutaneous Injection of Chloral Hydrate. By Dr. Higginson and Dr. Hall.	545	33. Hydrophobia; supposed Two and a Half Years' Incubation. By Dr. Féreol.	547

SURGICAL PATHOLOGY AND THERAPEUTICS, AND OPERATIVE SURGERY.

34. On the Bloodless Method. By Prof. Esmarch.	548	fully treated by Chloral and Morphia. By M. Bourdy.	557
35. On Simple Ligature as a Means of Preventing Loss of Blood. By Dr. Colletti.	550	42. Excision of the Scapula and nearly the entire Clavicle for Malignant Disease. By Mr. C. S. Jeaffreson.	557
36. On the Production of Anæsthesia by Compression. By M. Le Fort.	550	43. Ligature of the External Iliac in Elephantiasis. By Professor Hueter.	558
37. On the Mechanism of Hernial Strangulation. By Dr. Hermann Lössen.	551	44. Treatment of Gluteal Aneurism. By Mr. Timothy Holmes.	559
38. Treatment of Syphilis. By Prof. von Sigmund.	552	45. Surgical Treatment of Inguinal and Femoral Aneurism. By Mr. Timothy Holmes.	559
39. Excision of Cancer of the Breast by Scissor-Cutting under Ether Spray. By Dr. B. W. Richardson.	554	46. Treatment of Popliteal Aneurism. By Mr. Timothy Holmes.	560
40. Superiority of Immobility to Resection of the Hip-joint in Suppurating Coxalgia; Disadvantages of Resection; Rarity of the Indication for it. By M. Viennois.	556	47. Treatment of Hemorrhoids by the Injection of the Tincture of Chloride of Iron. By Dr. Wm. Colles.	560
41. Traumatic Tetanus success-		48. Removal of Tumour from the Bladder. By Dr. Schwaighofer and Prof. Billroth.	561
		49. Billroth's Case of Extirpation of the Larynx and Epiglottis.	562

OPHTHALMOLOGY.

50. Treatment of Exophthalmic Goitre with Belladonna. By Dr. R. T. Smith.	562	54. On the Ophthalmoscopic Appearances of the Optic Nerve in Cases of Cerebral Tumour. By Dr. Fitzgerald.	564
51. Removal of Opacity of the Vitreous Body by the Electrical Current. By M. Le Fort.	563	55. Extraction of a Piece of Steel from the Vitreous Humour by the Magnet; Recovery with almost Perfect Vision. By Dr. Wm. A. McKeon.	564
52. Results of Cataract Operations. By Dr. Albert Mooren.	563		
53. Bader's Operation for Conical Cornea. By Dr. Charles Bell Taylor.	563		

MIDWIFERY AND GYNÆCOLOGY.

	PAGE		PAGE
56. Induction of Premature Labour. By Dr. J. G. Swayne.	565	Pregnant Women suffering from Disease of the Heart. By Dr. Michel Peter.	573
57. Puerperal Convulsions. By Dr. Thomas Moore Madden.	567	60. Explanation of the Rigor which so often attacks Puerperal Women immediately after the Birth of the Child. By Pfannkuch.	574
58. Anæsthesia in Obstetrics; Nélaton's Method of Resuscitation from Chloroform Narcosis. By Dr. J. Marion Sims and Sir John R. Cormack	570	61. A New Sign of Pregnancy. By M. le Prof. Pajot.	574
59. Accidents that may happen to			

AMERICAN INTELLIGENCE.

ORIGINAL COMMUNICATIONS.

Case of Delivery of a Child weighing only one pound and three-quarters; Child now living. By Geo. A. Mursick, M.D.	575	Chloral Hydrate in Malarial Congestion. By Jno. R. Taylor.	577
Case of Double Uterus. By O. Cooley, M.D.	575	Hair-pin in the Female Bladder. By F. S. Sharpe, M.D.	577
Rigidity of Os Uteri treated by Chloral. By F. S. Thomas, M.D.	577	Report of a Case of Gunshot Wound of Head. By J. F. Gladney, M.D.	578

DOMESTIC SUMMARY.

Treatment of Fractures of the Femur by Immoveable Apparatus, and especially by Plaster of Paris on the form of Continuous Roller. By Dr. Frank H. Hamilton.	578	Microscopical Appearance of the Brain of the Insane. By Dr. Walter Kempster.	581
Prolapse of the Umbilical Cord, its Cause and Treatment. By Dr. Geo. J. Engelman.	579	Report of One Hundred Observations made with a View to the Determining of the Sex in Utero. By Drs. Albert B. Strong and D. A. K. Steele.	582
Aneurism of the Left Subclavian Artery cured by Distal Ligation. By Mr. R. A. McLean and Prof. Toland.	580	Diphtheria treated by Local Application of Subsulphate of Iron. By Dr. A. W. Nelson.	583
		Case of Uterine Fibroid removed according to a New Principle of Operation. By Dr. Emmet.	583

THE
AMERICAN JOURNAL
OF THE MEDICAL SCIENCES
FOR OCTOBER 1874.

ART. I.—*On the Local Treatment of Pulmonary Cavities by Injections through the Chest-wall.* By WILLIAM PEPPER, M.D., Clinical Professor of Medicine in the University of Pennsylvania.

It is not difficult to explain the recent revival of interest in the attempt to employ direct local applications in the treatment of phthysical cavities in the lungs. Undoubtedly it may be partly traced to the increasing familiarity and confidence in the use of delicate trocars and exploring needles in puncturing different tissues for purposes of diagnosis or for the removal of morbid effusions. But even more largely is it to be traced to the recent modification of medical opinion as to the nature and prognosis of certain cases of pulmonary phthisis. As far back as our knowledge goes, there have been occasional reports of recovery of cases of reputed phthisis, and many of the older authors freely admitted the possibility of such an occurrence. It is difficult for us to determine at the present time how far this belief was unfounded, or how far it was justified by the actual results of their practice. Our greatest difficulty in appreciating the value of such opinions lies in the simple fact that all clinical histories of thoracic disease, published before the introduction of percussion and mediate auscultation, and where the diagnosis is not verified by post-mortem examination, are hopelessly vitiated. No one, even at the present day, when the knowledge of ætiology and symptomatology is so precise, would pretend to diagnose, without the aid of auscultation and percussion, between empyema with or without pulmonary fistula, chronic pneumonia, bronchiectasis with copious purulent secretion, and pulmonary phthisis. All who have critically studied such essentially diverse conditions as these—and their number might readily be increased—must be aware how deceptively similar the general symptoms are in certain cases, and how entirely we fall back upon

the aid furnished by physical diagnosis. Yet it is in the face of this uncertainty as to the precise morbid condition present, that we are obliged to accept the conclusions of medical authors before the days of Avenbrugger and Laennec, drawn from their treatment of cases of chronic thoracic disease. I call particular attention to this point now, because it will be seen later that the historical discussion of the local treatment of pulmonary cavities has been confused by the introduction of much of this defective and unreliable evidence.

Following the more precise study of the signs and lesions of pulmonary diseases inaugurated by Laennec, and the diffusion of his brilliant but too exclusive theories upon tuberculosis of the lungs, the most despairing views were adopted as to the prognosis and curability of pulmonary phthisis, under the idea that all cases where cheesy deposits and yellow granulations occurred were to be regarded as essentially tuberculous and incurable. It would be presumptuous as well as out of place at present, to speak decidedly as to the nature of certain apparently distinct lesions frequently met with in the lungs. The results of modern investigation have carried medical opinion on this subject first in one direction, then in another, and the remarkable discussion upon tuberculosis held at the sessions of the London Pathological Society, during the past winter, may be taken as proof of the difficulty of definitely formulating our present knowledge of the nature and relations of the various lesions known as true miliary tuberculosis, cheesy infiltration, and fibroid degeneration. But though it is probable that Niemeyer and his immediate followers were extravagant in their views of the essentially non-tuberculous character of many cases of pulmonary phthisis, the clinical fact remains that in different cases of phthisis the morbid process presents vast differences, both in its vital tendencies and gross anatomical characters; in its rapidity of development, tendency to extension and diffusion, and influence upon the general health. The attempted classification of phthisis has also been derided on account of the signal want of success of any of the plans of treatment which were introduced in consequence of the modified theory of the nature of the disease. Undoubtedly no specific has been discovered, nor is it possible that one ever should be. Unfortunately, also, no new remedies or new modes of using old ones have been introduced which have sufficed to very materially change the former well recognized course of pulmonary phthisis. But still it would be most short-sighted to deny that the whole discussion has been highly serviceable to the treatment of this complex condition. It reawakened an interest and enthusiasm in the attempts to cure phthisis, which is already bearing fruit in a more judicious adaptation of remedies to special cases; and in a more extended study of the influence of diet, and especially of climate, upon the different forms of the disease.

The recognition of the importance of inflammation as a cause of many of the lesions met with in phthisical lungs, and the fact of some cases

depending in the early stage, if not throughout, upon an unhealthy low grade of inflammation of the lung tissue, led me, so far back as 1867, to begin the consideration of the possibility of applying directly to the seat of the disease some of the alterative agents which prove so effectual in the treatment of analogous inflammatory states of external tissues. After passing in review the various modes by which this might be accomplished, I concluded that it could be most safely and satisfactorily done by passing a very delicate canulated-needle through the intercostal tissues into the diseased area, and injecting suitable fluids directly into the affected tissue. I began this mode of treatment of cases of pulmonary vomicae in February, 1874 (*Phila. Med. Times*, March 14, 1874), and a few weeks afterwards received the number of the *Berliner Klinische Wochenschrift*, October 27, 1873, containing an account by Prof. W. Mosler, of Griefswald, of several cases treated in a somewhat analogous manner.

I have already spoken of a recent *revival* of interest in this question, but in reality the local treatment of vomicae in the sense in which the term is here employed and in the manner which will be fully detailed, has never been attempted, so far as I am aware, until very recently. As this question has, however, given rise to some discussion, it may not be without interest to consider the following points:—

1st. The history of the direct local treatment of pulmonary cavities by thoracentesis.

2d. The indications it is designed to meet.

3d. The more recent methods proposed.

4th. The dangers and disadvantages of such treatment.

5th. The clinical results of this mode of treatment.

It is extremely difficult either to confirm or disprove the statements made that Hippocrates recommended puncturing pulmonary cavities. In very many places in the Hippocratic writings (both in those which are undoubtedly genuine, as well as in those which are plausibly attributed to some writers of the Cnidian school) we find mention made of empyema, of its diagnosis, terminations, and mode of treatment, in which paracentesis thoracis always has a place. In some instances the language used in describing the cases of so-called empyema is such as to have led the eminent scholar Littré (*Œuvres Complètes d'Hippocrate*, tom. ii. p. 97) and Francis Adams, the editor of the Sydenham Society edition of the genuine works of Hippocrates, to doubt whether this term was not sometimes used to denote phthisical cavities. The conclusion to which I have myself been led is that the cases of paracentesis referred to by Euryphon of Cnidos, by Hippocrates, Galen, Aëtius, Avicenna and Avenzoar, and by Rhazes, were performed for the relief of empyema. Owing, however, to the absence of any reliable diagnostic symptoms, it may be that in some instances pneumonic abscesses or even tuberculous cavities were punctured. It appears unlikely, however, that this latter lesion is intended

air descriptions, since, as a rule, the operation is directed for the evacuation of a collection of pus, and very frequent mention is made of the external appearances which indicate the approach of the pus to the surface by ulceration of the intercostal tissues. So far as an analysis is permitted of the clinical histories of such cases they would seem to refer rather to the development of pyothorax than of pulmonary phthisis. It may at least be safely concluded that none of the older physicians designedly recommended or practised thoracentesis in cases of phthisical cavities in the lungs.

Still less can we determine from the writings of authors during the middle ages that this operation was ever performed at that time. Paracentesis, even for clearly recognized pyothorax, was almost abandoned: it being scarcely admitted, according to Trousseau (*Clinical Medicine*, Syd. Soc. Ed., vol. iii. p. 207), that there were any cases, except those of surgical lesions, in which the operation ought to be performed. Ullersperger, in his treatise on the curability of phthisis (*Die Frage ü. d. Heilbarkeit der Lungenphthisen*, Wurzburg, 1867, p. 234), affects to regard the puncturing of tuberculous cavities as a mere form of paracentesis for empyema, and quotes without hesitation, but without any proof, a list of nearly-forgotten writers as having performed it. So far, however, as can be inferred from their imperfect descriptions, there seems little doubt that the operations were performed for the relief of ordinary cases of empyema.

Coming to more recent times, when thoracentesis had regained favour and was made the subject of numerous treatises, we find Baglivi, in 1696, using the following language:—

“A phthisick arising from an ulcer is commonly branded as incurable, upon the plea that the ulcer is internal and occult, and cannot be cleaned like other external ulcers. But why do they not make it their business to find out the true situation of the ulcer, and make an incision accordingly, between the ribs, to the end that proper remedies may be conveyed to it? For my part, I know no reason why that should be neglected. About seven years ago, when I was at Padua, a man received a wound in the right side of his breast, that reached to his lungs, and, employing an able surgeon, had an incision made between the ribs to the length of six fingers' breadth, in order to discover the situation of the wound in the lungs, which was perfectly cured in two month's time, with vulneraries applied with tents and with syringes. Now practitioners ought to use the same piece of diligence in curing a phthisical ulcer in the lungs, lest the scroll of incurable diseases should grow too long, to the infinite disgrace of the profession.”—*Practice of Physick* (English trans.), 2d edition, London, 1723, p. 301.

This is referred to by Ullersperger (*loc. cit.*), and is quoted in full by Hutchinson (*Phila. Med. Times*, May 30, 1874, p. 548), in a critique upon my former article on this subject, with the following comment: “We have sufficient evidence in the above that the propriety of establishing a communication between the lungs and the outer air through the walls of the chest, for the purpose of applying remedies directly to the seat of disease, in cases of phthisis, was entertained as early as the seven-

teenth century." Unquestionably credit must be given to Baglivi for the suggestion that such a procedure should be employed; but the very terms in which he advocates it sufficiently imply that its propriety was not entertained by physicians, while with himself it appears to have been a mere speculative idea, which he never attempted to carry out. As to the case which is so briefly narrated by Baglivi, it seems difficult to form any clear idea of the condition actually present. It can hardly be credited that an incision not less than four inches in extent was made down to the surface of the lung soon after a penetrating wound of the thorax. The favourable results often observed in such cases when the wound is quickly closed and the case trusted to nature, would render such an operation most improper. If pneumothorax did not already exist, it would certainly be induced. More probably the case was one of limited pleural abscess or empyema following a penetrating wound of the thorax. Many cases of this kind, treated in the same way and with equal success, are to be found in even older writings than those of the learned Baglivi.

A much more valuable contribution to this subject was made by Barry (*Treatise on Consumption*, 2d edition, London, 1727, p. 267), also quoted by Ullersperger and Hutchinson, who describes carefully the anatomical relations of phthisical cavities, pointing out especially that there is generally close adhesion between the pleuræ over their seat, so that an incision might be made into them without danger or difficulty. In his first publication, after discussing the operation with remarkable clearness, he says: "'Tis most certain that many phthisical persons may by this means be preserved, that will otherwise unavoidably perish. If the operation be rightly performed, there is great reason to expect success, neither if it fails can it be attended with any very great danger, or much contribute to hasten their fate." He adds, as another advantage of the operation, that "the ulcer may be more easily cured by deterging and healing injections." In his later publication (*Treatise on the Three Different Digestions*, etc., London, 1763, p. 360 *et seq.*), he repeats the same reasoning and advice, and gives several cases in which he had the operation performed. When we remember, however, that he had no better guide to direct him in his diagnosis than "to open the breast where the most frequent pain and oppression direct the situation of the ulcer," it is not surprising that it should appear doubtful, after a careful study of these cases (although accepted unquestioningly by Hutchinson), whether it was really a pulmonary cavity which was opened in a single instance. Certainly the clinical symptoms detailed are very unlike those so familiar in phthisis, and very similar to the phenomena of some cases of circumscribed empyema, in some instances opening into the lung tissue and partially discharging through the bronchi. Mosler refers to Barry's views as being without practical results, but this scarcely assigns to them their proper value, since not only did they lead Barry himself to attempt the opera-

tion, but it will be seen that more than a century afterwards they induced the performance of operations which anticipated, in many particulars, those of Mosler himself.

In the present century Richter (*Bemerk. ü. d. Lungensucht, in den gelehrten Götting. Anzeigen* 49. Stück v. 28. Marz., 1805, p. 481) recommends incising pulmonary cavities, and reports two supposed cases in which he operated successfully. In the first of these, redness, swelling, and fluctuation presented themselves in the fourth interspace, and an incision at this point gave exit to a large amount of pus, followed by recovery. In the second, the patient became phthisical after an attack of pneumonia. An incision was made over a spot where there had been fixed pain, fluctuation was detected, and $1\frac{1}{2}$ pounds of pus evacuated, after which the patient gradually recovered.

These may be taken as illustrations of a number of cases which have been published before or since, where it is difficult to doubt that, although the operator recommended the operation with the deliberate intent of evacuating a phthisical cavity, he had in reality to do with a simple empyema, or possibly a true pneumonic abscess, though this latter lesion is so rare that it can hardly have existed in any large proportion of the cases recorded. Such cases were published by Herff, quoted by Canstatt (*Spec. Path. u. Ther., von Hensch, 3te. Aufl. 2 Bd. p. 687*), but I have not been able to get access to the original account.

Ramadge (*Consumption Curable*, London, 1836), who wrote a treatise characterized by the most unbounded egotism and ignorance of pathology, in support of his method of curing phthisis by forced inhalation, reports several cases where thoracentesis was performed. In the first case, called by him "supposed consumption cured by paracentesis," slight swelling presented itself two inches beneath the left nipple, and the heart was dislocated to the right; an incision through the intercostal tissues gave issue to yellow pus with a quantity of air which rushed out with a hissing sound. Unquestionably this was a case of pneumothorax following an empyema which had partly discharged through the lung. In the second case, styled "Consumption cured by Paracentesis," the clinical history, the description of the operation, and the results of post-mortem examination all show that the case was one of chronic plastic pleurisy, with fibroid change in the apex of the right lung, and that the operator merely introduced a trocar through the fourth intercostal space into comparatively healthy lung tissue, without causing any serious results. In his fifth case he describes the operation on a patient with phthisis, who had a chronic abscess in the apex of the left lung, as follows:—

"A trocar was introduced between the second and third ribs, in a line nearly perpendicular with the left nipple; very little matter escaped, as I had expected, for my chief object in performing this operation was to insure the emission of the air, and thus effect a diminution of the cavity by the expansion of the inferior lobe of the left lung. I kept the punctured place open for

about ten days, by the introduction of a small piece of catgut properly secured externally; when, finding that the cavity became so contracted, through the encroachment made on it by a general pulmonary expansion, as to preclude all further escape of air, I withdrew it. About this time a catarrhal affection of the inferior lobe of the punctured side supervened. In less than two months my patient was able to go out, and had completely lost his phthisical symptoms. In less than two years after the operation he was in the enjoyment of excellent health, the only drawback being the existence of catarrh, to which he more immediately owes his recovery."

It is evident that in all of these cases the intention was to directly open pulmonary cavities, though it may be doubted whether, even in the last case, the end was obtained. Certainly the procedure, undertaken with a most mistaken object, cannot be regarded as having had the slightest influence upon the condition of the patient. In a brief article published nine years later, Dr. Herbert, a pupil of Dr. Ramadge, states that "within eighteen months, he has been present at seven such operations performed under Dr. Ramadge's direction, and has in no case seen them attended with any inconvenience or followed by disagreeable consequences." (*Lancet*, 1845, vol. i. p. 75.) Unfortunately, this appears to be the sole record of the cases, and although it is evident from this that Ramadge continued to puncture chests where he supposed cavities to exist, in order to "give exit to the air," and "induce expansion of the surrounding lung tissue," it is impossible to determine the real nature of the cases operated on or the results of the operation. It is certain that the arguments by which he supported his practice very naturally failed to attract attention or to induce others to follow his example.

In the year 1845, Dr. Hastings and Mr. Storks (*London Med. Gaz.*, 1845, vol. xxxv. p. 378), published an interesting and well-observed case of pulmonary phthisis, with a large cavity at the left apex which was opened by the latter by an incision in the third interspace. A piece of gum-elastic catheter was introduced and worn constantly from the date of the operation, November 15, 1844, to December 23, 1844, which is the latest detailed report of the case. Pus was discharged through the tube from time to time, and it is reported by Dr. Hocken (*London Med. Gaz.*, 1845, vol. xxxv. p. 481 and 509),¹ who conducted the subsequent treatment of the case, that the patient's general symptoms improved, with a diminution in the cough and amount of purulent secretion. A still later report is made by Dr. Hastings (*London Med. Gaz.*, 1845, vol. xxxvi. p. 767), who, writing six months after the operation, says: "Although very weak, the patient has latterly been able to get out when the weather has been fine. His expectoration for the last two or three months has not averaged more than two drachms in the twenty-four hours."

¹ These are the papers referred to by Mosler, under the name of Hocken, with statement that he had been unable to discover them.

These authors quote Barry (*loc. cit.*) as their authority for the operation, but do not seem to have ever heard of the publication of Ramadge.

It is certainly not a little singular that after this time, the subject appears to have attracted no attention whatever, and that the remarkable cases to which we have above referred, should have induced none of the many physicians specially engaged in the study of pulmonary diseases to examine into the value of this simple operation. With the exception of a courteous, but not convincing critique by Campbell (*Lancet*, 1845, vol. i. p. 675), no discussion appears to have been aroused, and the matter fell into entire forgetfulness.

It is not alluded to by Trousseau in the exhaustive history of Thoracentesis in his *Clinique Médicale*, nor by Walshe, nor Copland, nor even by Waldenburg (*Die locale Behandlung d. Krankh. d. Athmungsorgane*, Berlin, 1872). Canstatt observes merely, in referring to the recommendations of Herff and Hocken, that they will scarcely find many followers, since, apart from the uncertainty of the existence of pleural adhesions, the emptying of a cavity could have no beneficial influence upon a disease, which is usually characterized by the formation of several cavities, and which springs from a general diathesis. And Bennett (*Reynolds' Syst. of Medicine*, first ed. vol. iii. p. 589) briefly says: "pulmonary cavities have even been opened from without, and variously treated with the view of causing cicatrization, but all such attempts have been, what an intelligent consideration of the pathology of the disease might have anticipated, a uniform failure."

It is difficult to explain the almost entire failure of this operation to attract even the criticism of eminent observers. It is true that it had been by some recommended for objects which were evidently unattainable, and that the cases which were given in illustration of its successful performance were so inaccurately reported as to afford no sound basis for its repetition, although neither of these objections can be brought against the case reported by Hastings. More probably it was condemned by medical pathologists on the ground that it was directed only against a local expression of an incurable constitutional disease. And it is also quite possible that some unfortunate cases which have not been placed on record may have helped to bring it into disrepute.

Within the past few years we find several observers engaged in the study of this subject. Thus in 1873, Dr. Wilhelm Koch published (*Langenbeck's Archiv. f. Klin. Chir.*, 15te Bd. 3te Hft.) the results of experiments which showed that injections of dilute solutions of iodine might be made with impunity into the lung tissue of dogs; and suggested, in consequence, that this mode of treatment might be applicable to some diseases of the lungs in human subjects. This article seems to have attracted no notice, and was unknown even to Mosler (*Berl. Klin. Wochenschr.*, No. 45,

November 10, 1873, p. 542), at the time of publication of his article referred to below.

The attention of the profession was more forcibly attracted to this subject by Mosler of Griefswald (*id. op.*, October 27, 1873), who appears to have been ignorant that the operation had ever been performed, merely stating that "such a proposition was made by Barry in 1726, and renewed later by Masse, v. Herff, Hooken (*sic*), without, however, any practical results."

In two cases he simply punctured the cavity with a "tolerably large canula" which was permitted to remain. In a third case he operated very much after the manner of Storks (*loc. cit.*), by making a long incision (3 ctm.) along the upper border of the 3d rib, and then gradually opening the wall of the cavity with a suitable pair of forceps, and introducing a pretty large silver drainage tube; but in addition he conjoined the use of medicated injections through the canula directly into the cavity. In the first case, one injection of dilute solution of permanganate of potash was practised; in the second, five were employed; and in the third case, their use, as well as that of dilute solution of iodine and carbolic acid, was continued for some time. The particulars of this interesting paper (*American Journ. of Med. Sci.*, July 1874, p. 253), are so fresh in the minds of our readers as to render further allusion unnecessary. Suffice it to say that in none of the cases did the slightest ill result attend the operation or the subsequent injections, and that in the only instance in which the latter were employed continuously, there was a positive improvement in the pulmonary symptoms, although death occurred three months subsequently from albuminoid degeneration of the kidney and spleen, associated with disseminated miliary tubercles in the left lung.

In February of the present year I began to treat pulmonary cavities by injecting dilute solutions of iodine through a delicate canula, and have continued to do so until the present time with results that will be given in detail at the close of this paper. At that time I was unaware that the local treatment of phthisical cavities had ever been attempted before, and it will be seen that the method which I have used differs in several very important respects from any hitherto employed.¹

¹ The mere question of priority as to the idea of local treatment of pulmonary cavities seems to me very unimportant. In the London *Lancet* for March 28, 1874, Dr. Birkard states that he conceived this idea so long ago as 1872, and that lately he has injected a weak solution of carbolic acid through the thoracic parietes into the lung in a very bad case of phthisis. The injection seems to have been performed but once, and to have caused no inconvenience, but no details whatever are furnished. Prof. Mosler has been engaged upon the subject since the latter part of 1872. I have already alluded to my determination announced so far back as 1867: but Baglivi in 1696, although it is not probable that he ever carried it into execution, clearly expressed the suggestion that this local treat-

Before proceeding to speak of the actual results, so far as known, of the local treatment of phthisical cavities, it is proper to allude briefly to the indications which may be thought to present themselves in favor of this method, as well as to the objections which have been advanced against it.

It is very easy to overstrain the argument which is often drawn from the unfavourable nature of a disease in support even of the most unpromising plans of treatment. And yet, in the present discussion, it is but fair to bear in mind that the treatment proposed is for a condition which is universally conceded to be usually a mortal one. It is true that, in the earlier stages of phthisis, even after the general symptoms and physical signs positively indicate organic disease of the lung tissue, recoveries are not rarely observed. But after a cavity of considerable size has formed, even though it be single, the remaining lung tissue healthy, and the constitutional disease inactive, the course of the case is generally downward.

Pollock, in his masterly memoir on the *Elements of Prognosis in Consumption*, says:—

“The cure of cavity in the lung has long been a vexed question. I presume there is now no doubt in the minds of the most experienced observers that cavities close and heal up. If the cessation of all the physical signs of such a lesion, and the perfect restoration of health, be considered evidence sufficient, there are cases enough of this kind on record by good authorities to justify the opinion that this form of cure is possible. But all agree that it is not frequent; and its infrequency must be apparent from the facts that, out of an experience of 4530 cases, most carefully noted at the Hospital for Consumption by myself personally, I can only place on record 68 cases of well circumscribed cavity, with 13 presenting the characters of ‘retracted cavity,’ in all 81 instances in which the patients seemed progressing towards a cure of cavity.”

It will probably be the experience of most observers that, although 1.8 per cent. of patients with circumscribed cavities of considerable size may for a long time seem progressing towards a cure, a far less proportion will actually enjoy entire recovery.

The dangers which surround a patient with a pulmonary cavity are indeed serious. There is, in the first place, the risk of hemorrhage which, though rarely directly fatal, is often profuse. Granting also that the original disposition to tuberculous deposition has been expended, or that the cavity has proceeded from a non-tuberculous ulcerative process, recent observations have demonstrated the great danger of secondary constitutional infection and the development of miliary tuberculosis in cases where there are long-standing centres of softening caseous infiltration or of unhealthy suppuration. It should also be remembered, that, under the most favourable circumstances, patients with lung cavity are constantly in a state of feeble vitality, sufferers from harassing cough and dyspnoea on exertion,

ment was feasible. The only merit in question seems to me to be in connection with the actual demonstration of the feasibility and clinical value of making local applications by thoracentesis to lung cavities, the determination of the best manner of doing this, and the decision as to which cases are best suited for such treatment.

and liable to dangerous intercurrent attacks. Unfortunately, in the vast majority of cases we also find evidence that the diseased action is invading the lung tissue surrounding the cavity, and that the morbid process shows little tendency to become circumscribed.

The objects which have been sought by the ordinary methods of treatment in such cases, have been to remove the constitutional diathesis, to disinfect the discharge from the cavity, to check the paroxysms of cough, and to alter by counter-irritants, internal remedies, and inhalations, the morbid action in the walls of the cavity.

So it will be observed that the objects proposed by the authors who have recommended opening the cavity, are similar in character. It is true that Ramadge (*op. cit.*) advocated the operation with the curious notion that, by insuring the emission of the air, he could effect a diminution of the cavity by the expansion of the remaining portion of the lung, bringing the surfaces of the cavity into contact, so that they would unite and cicatrize. But Barry, in 1727 (*op. cit.*), recommends forming an artificial opening into the cavity, in order that the matter may be readily and completely discharged, and that, by thus avoiding the necessity for violent paroxysms of cough, the diseased part may be kept more at rest, while, at the same time, suitable detergent injections may be employed. So, too, Hastings and Storks (*loc. cit.*) performed this operation with the same objects in view, and, as has been seen, endeavored to secure them by leaving a piece of gum catheter in the wound, so as to maintain the direct communication between the cavity and the external air. One of the results obtained, then, by this operation, as performed by Storks and repeated recently by Mosler, is a certain degree of rest for the walls of the cavity and the tissue immediately surrounding. It is of course evident that, as the cavity will freely communicate with the air, both by the bronchial tubes and by the canula, its walls will still be subjected to ordinary atmospheric pressure which will suffice to prevent any marked collapse of the cavity. But, on the other hand, as the air which enters from the bronchi during inspiration can immediately and freely escape, it will be found that the respiratory movements of the lobe containing the cavity become much diminished. In addition to this, the regular and free discharge of the purulent secretion of the cavity through the canula, will, as would be anticipated, and as has been shown by experience, lessen the frequency and severity of the cough. In rare cases, the communication of the cavity with the bronchi is such that the pus which forms readily passes into the air-tubes and is expectorated with ease. But most frequently, the process of emptying a cavity by cough is a wearisome, painful, and injurious one; and, as the paroxysms are often excited by eating and drinking, it is by no means rare to have such frequent vomiting from this cause as to seriously interfere with nutrition. It can scarcely be doubted that the avoidance or mitigation of this violent cough, and the comparative rest given

to the cavity, would favour cicatrization of its walls and tend to prevent its extension.

The other advantage which is gained by this mode of operating (inserting a comparatively large canula) is the power of disinfecting the contents and walls of the cavity by injections. Although mention is made by some of the earlier writers of the use of detergent applications, it cannot be shown that such injections into lung cavities were really employed before their use by Mosler. It appears to me, however, that this author has attached undue importance to the mere disinfection of the secretion of the cavity as compared with the modification of the morbid action in the wall of the cavity itself. The opportunity of endeavouring to bring about such a modification is, indeed, to my mind, the greatest advantage derived from this operation. It can be effected when a canula has been allowed to remain in the opening by injecting directly into the cavity a suitable amount of such dilute solutions as may seem proper. Mosler introduced weak solutions of iodine and carbolic acid in one of his cases by atomization, but appears to have aimed chiefly at the disinfection of the contents of the cavity. Up to this time, I have limited myself in the local treatment of phthisical cavities, to the repeated injection, through a delicate canulated needle, of small amounts of solutions of iodine of various strengths, the canula being introduced into the cavity at the time of each injection and immediately withdrawn. As thus performed, of course the operation does not affect the relations of the cavity to the external air, nor does it in any way facilitate the escape of the secretion. The sole value of such treatment must then depend upon the question whether we are able to modify beneficially the morbid action on the surface of pulmonary cavities and in the surrounding diseased lung tissue. Dr. Hutchinson (*loc. cit.*), in speaking of this point, says:—

“Moreover, the opinion that injections may be of service in the treatment of phthisis rests, we think, upon a mistaken therapeutic basis. In certain conditions of the serous membranes, they are unquestionably useful by exciting inflammation, but a little reflection will convince any one, who has abandoned in whole or in part the theory which makes phthisis the result of tubercular deposit, that this is the very last thing to be desired in the disease. The object aimed at in the management of phthisis, and especially in those local cases in which Dr. Pepper thinks the injections are most likely to be useful, is to allay inflammatory action, not to excite it. We therefore are unable to see how they can be productive of any good; on the contrary, if they light up an inflammatory process in the walls of the cavity, this will be very likely to extend to the circumjacent tissue, and thus the disease, which may have been previously held in abeyance, be roused into activity.”

We must remember, however, that the terms *allaying* and *exciting* inflammatory action are purely relative ones, dependent upon the grade of morbid activity present. It can hardly be thought desirable, in a case where a caseous pneumonia is rapidly degenerating and breaking down in the centre, to attempt to *allay* the morbid action. It is probable that our best chance of preventing the ulcerative destruction of the whole af-

affected area would be, if it were possible, to apply a sufficiently powerful stimulus to *excite* a more healthy degree of cell action in the least affected parts, so that we might induce the development of fibro-cellular tissue, and thus limit the morbid process. We are perfectly familiar with the necessity and practical rules for graduating the stimulant or sedative characters of applications to external ulcers; and know well that there are many cases of unhealthy destructive ulceration which are most relieved by powerful alterative stimulant applications. There is a wide difference in the action of such substances when applied to the seat of the disease, and when applied to the surrounding healthy tissue; and applications which are most useful when made directly to a phagedenic ulcer, might, if made to healthy tissue in the neighbourhood, excite destructive ulceration.

So, too, with regard to circumscribed cavities, which are often lined with a layer of granulation-tissue which is constantly the seat of the formation of pus—the so-called “pyogenic membrane”—it is perfectly conceivable that some application might be made which would not *allay* the inflammatory action there, but *excite* a more healthy action by its alterative stimulant effect, and thus lead to a diminution of secretion, and a progressive contraction and cicatrization of the cavity.¹

It is evident of course that the analogy between ordinary external ulcerations dependent on local causes, and ulceration of the lung tissue, must be drawn with great caution. It is the most hopeless feature of the latter that it is so frequently dependent upon a profound alteration of general nutrition, and that it is so apt to be associated with the presence of specific tuberculous formations in the lungs. Undoubtedly, therefore, in cases where the constitutional diathesis is marked, and the cavity is associated with diffused disease of the lung tissue, no one would think of undertaking a special treatment for the cure of the cavity. But, on the other hand, we meet with many cases where, without raising the question of their relation with tuberculosis, the constitutional affection is at a minimum, and the pulmonary disease is comparatively circumscribed, consisting of a cavity, secreting pus, and surrounded by more or less fibroid induration or cheesy infiltration of the lung tissue. We are familiar with the dangers in such cases—of gradual exhaustion, of hemorrhage, of progressive extension of ulceration, and of secondary infection of the constitution—and I can conceive of nothing more desirable in practical medicine than to be able to modify

¹ Dr. Hutchinson alludes to the development of connective tissue, “the effect of which will be to enlarge and keep open the wound made by the aspirator or trocar, and thus to allow the escape of the contents of the cavity into the pleural sac whenever this is not prevented by close adhesions.” I cannot discover the force of this objection. The opening made by a delicate needle is so minute that it can scarcely allow the escape of any fluid, and if there are any cases of phthisis where pleural adhesions are sure to exist, they are precisely those where there is a marked development of fibro-cellular tissue in the lung.

the action of the inner surface of such a cavity, to check the amount of purulent discharge, and thus favour its gradual cicatrization and contraction. Under the most unfavourable view of the essential nature of such lesions, I can conceive of no objection to such an attempt, provided it can be made with safety ; and when we are in possession of a method by which this can be effected, it seems to call for a patient and extended trial. In considering carefully the clinical histories of cases where lung cavities have undergone cure, it will be found that so long as active secretion of pus takes place from the seat of disease, with violent paroxysms of cough, there is little progress towards cure. But as the ulcerated surface heals, there is a development of fibro-cellular tissue around the cavity which continually tends to contraction. The discharge diminishes and the cavity is less frequently subjected to the violent distension occasioned by severe coughing. The chest-walls over the site become depressed and retracted, the heart is displaced *towards* the affected spot, partly by the traction of the contracting lung, partly by the pressure of the opposite lung, which undergoes compensatory hypertrophy and encroaches more and more upon the mediastinal space. It is thus seen that the phenomena which attend the cure of a lung cavity are similar to those with which all are familiar as marking the cure of a chronic pleurisy where the lung is so bound down by adhesions as to be unable to expand. And it will be noted that, in the cases reported in this article, the improvement in the cavity is attended, and to a certain extent measured, by the development of these phenomena of compensation.

I have already said that the most important object sought by this local treatment of lung cavities seemed to be this very modification of the morbid action of their lining surface ; and it is on this account that the mode of treatment suggested in my former paper appears to me preferable to the operations of Storks or Mosler, although by these a free escape of the discharge from the cavity is secured, and its walls are more immediately afforded rest. It enables us to bring any desired amount of an appropriate solution in contact with the inner surface of the cavity, or with any part of its wall ; while at the same time it is entirely free from the objection of maintaining local mechanical irritation, such as might result from the prolonged presence of a canula. In order to show how simple a mode of treatment it is, and at the same time how well calculated to fulfil the chief indication we have laid down, I will ask attention to a brief description of the manner in which I have carried it out during the past six months.

The cavities which have hitherto presented themselves for treatment have been in the upper lobe, so that all of the punctures which I have as yet made have been in the first, second, or third interspace. The point selected has been that at which the physical signs of a superficial cavity have been most intense. As a rule, the punctures have been made in the line of the nipple, although recently in two cases, owing to the increasing

contraction of the cavity and development of fibroid tissue, it has been necessary to select points half an inch inside or outside of the nipple line.

The apparatus consists simply of a very delicate steel canulated needle, like the finest hypodermic needles, but about three inches in length, and an ordinary hypodermic syringe capable of holding twenty-five minims. In my first experiments I used an aspirator, but as the withdrawal of any pus is not contemplated, it is in every way preferable to employ the more simple apparatus above mentioned.¹

In order to diminish the pain caused by the puncture, I have always employed local anæsthesia by freezing, and with this succeed in effecting the treatment without causing a murmur of complaint. Occasionally small filaments of nerves have been pricked, and have caused tingling, radiating pain, lasting for a few moments. The injections have been given while the patients were in a sitting posture, and I have usually directed a full breath to be taken before the puncture is made, and to be held during the injection. The time occupied by each injection does not exceed thirty seconds. The depth to which it will be necessary to introduce the needle will vary, of course, in different cases; in the injections which I have myself made, I have introduced it from one and a half to two inches. With a very little care the ribs can be avoided; and a reference to the anatomical distribution of the nerves and vessels in the thoracic walls will always enable the puncture to be made so as to avoid them. The only fluid which I have as yet injected into lung cavities, has been dilute liq. iodinii comp. In the earlier injections, this was used very weak (μ iv to $\mathfrak{f}\mathfrak{j}$), but for some time past I have increased it to μ xij in a fluidrachm; the quantity has also been gradually increased from four to twenty-five minims for each injection. The entire absence of any signs of irritation assures me that, if it were desirable, larger quantities of stronger solutions might be injected. The results of injections of iodine have been so satisfactory in the limited number of cases in which I have employed this mode of treatment, that I have felt indisposed to use any other substance. But it is highly probable that other solutions, alterative, astringent, or antiseptic, may be found preferable in some cases. Unmistakable evidence of the entrance of the iodine into the air-passages has frequently been secured by the immediate perception of its pungent peculiar taste by the patients. I need only add that hitherto the injections have usually been made once a week on an average; and that, of course, every detail of internal treatment and dietetic and hygienic care has been continued, as far as practicable in hospital patients.

It remains, before giving the actual results of this method of treatment, to examine briefly what dangers and disadvantages attend it. We trust,

¹ Indeed, I believe that the use of the aspirator is not without danger, as the powerful suction brought to bear on the inner surface of the cavity may cause hemorrhage. (See Case IV.)

in the first place, that we have succeeded in showing that, *if the operation itself be free from danger*, there are clear indications which demand for it a full, fair trial. We are led to say this, by clinical experience and theoretical reasoning, even though so careful a thinker as Dr. Hutchinson believes "that it is not likely to result in good to the patient;" or though Dr. J. Hughes Bennett thinks the results of all operative treatment in phthisis to be "what an intelligent consideration of the pathology of the disease might have anticipated, a uniform failure."

Mosler believes that he has demonstrated that "the local treatment of lung cavities can be effected" even by the comparatively serious operative method he employed; and I do not see how his statement can be impugned. But as there are radical differences between his method and the one which I have hitherto employed, I shall limit myself to the objections which may be brought against the treatment of lung cavities by repeated injections through the chest-walls, effected by a delicate needle.

And first, with regard to the effects of the puncture itself upon the pulmonary tissue through which the needle passes in order to reach the cavity. In the cases where this mode of treatment would seem to be indicated, the cavity is usually very superficial, and is separated from the pleura only by a wall of firm fibroid tissue. It would be almost impossible, I conceive, for the mere passage of a delicate needle through this tissue to excite any injurious action. At times, however, the cavity is separated from the surface by a layer of lung tissue in a state of cheesy infiltration. In order to determine the influence of a puncture in such a condition, I made the following observation:—

CASE I. *Hæmoptysis, followed by Phthisis; Rapid Extension of Disease; Repeated Injections of Iodine into a Spot of Caseous Infiltration; Death from Exhaustion; Autopsy.*—John D., æt. 29, a teamster, entered the Philadelphia Hospital March 11th, 1874. Has had scrofulous supuration of cervical glands, and has also had syphilis. In June, 1873, had severe hæmoptysis, whilst doing some heavy lifting, and this was followed by cough. In December, grew worse, with increased cough, pain in left side, and hoarseness. In February of the present year, began to lose flesh and strength rapidly. In April, he began to suffer with intense hectic fever, exhausting night-sweats, and frequent cough; his emaciation and prostration were extreme, and he was confined to bed. Pulse frequent, feeble, and markedly dicrotic. Physical examination showed consolidation of left lung throughout, with moist crackling over upper lobe. On right side, there was dry crackling at apex.

May 8. Condition rapidly growing worse. As it seemed impossible to arrest the disintegration of the left lung, it was determined to try the local effects of injections of iodine upon the lung when in a state of caseous infiltration. Accordingly mviii of dilute Lugol's solution (1 pt. to 6 of water) were injected, the needle being introduced to depth of one and a half inch in the second interspace. The puncture caused no symptoms whatever.

10th. Same injection repeated.

11th. Pulse not dicrotic; he seems slightly stronger.

15th. Same injection repeated.

21st. Has same injection repeated. Has again begun to sink.

24th. Disintegration of left lung advancing. Same injection repeated.

29th. Death occurred from progressive exhaustion.

At the *autopsy*, disseminated tuberculosis of the right upper lobe was found. The left lung was in a state of caseous infiltration throughout. At several spots, puriform softening was beginning; this was further advanced at posterior part of the apex, where the disease seemed oldest. A very careful examination of the points where the injections had been introduced was made; but there was no trace left to indicate them. The portion of lung into which the needle had been introduced to the depth of over an inch was thoroughly consolidated, and remained quite firm. There was no staining of this area with iodine. The pleuræ were adherent over the whole upper lobe. No trace of the passage of the needle through the intercostal tissues remained.

It will be seen, therefore, that in this case five injections of dilute Lugol's solution were made at short intervals into a lung in a state of caseous degeneration, and that the iodine introduced was completely absorbed by the tissue, while there was not a trace of any mechanical irritation from the punctures, either in the intercostal tissues, the pleuræ, or the lung tissue itself. The results of this case have an important bearing upon the possibility of directing local treatment to superficial circumscribed indurations or caseous infiltrations of the lung tissue; but, for our present purpose, I would simply call attention to the fact that they agree with our reasonable anticipation, and with the results of clinical experience, in showing that the passage of a delicate needle through a layer of infiltrated lung tissue can be effected repeatedly without injurious consequences.

Finally, it may happen that the cavity is separated from the chest-wall by a thin layer of healthy lung tissue. It is frequently possible to decide as to the existence of such a stratum of vesicular tissue by careful percussion and auscultation, and I should be inclined to regard the presence of a demonstrable amount of healthy tissue between the cavity and the thoracic wall as a contraindication against the operation. Still, it has been demonstrated frequently (by Bretonneau, Velpeau, Koch, myself, and others) that puncture of the lungs with a delicate needle may be safely performed in the lower animals. Our knowledge of the results of penetrating wounds of the lung would lead us to expect little injury from the minute puncture effected by a delicate needle; and finally, it has been shown by some of the advocates of acupuncture that fine needles may be introduced even to a depth of two inches¹ into the healthy human lung, without any injurious effect.

As to the danger of hemorrhage, in the second place, all experience goes to show that it is very slight, even if it exists at all. Dr. Hutchinson (*loc. cit.*) states, "in one of the cases reported by Dr. Pepper a slight hemorrhage fol-

¹ Memoir on Acupuncturation, by Morand, translated by Franklin Bache, Phila. 1825, p. 65.

lowed the introduction of the aspirator; and the same accident occurred in the operations done by Dr. Mosler and Dr. Hastings." In Dr. Mosler's case, however, the statement is distinctly made in the account of the operation that "no hemorrhage occurred." Ten days subsequently a hæmoptysis occurred, and was soon checked by astringents blown through the canula. As the patient is stated to have already had several similar attacks before the operation, the last one can hardly, with fairness, be connected with the treatment. In Mr. Storks's account of the operation on Dr. Hastings's patient (*loc. cit.* p. 384), the only mention of hemorrhage is, that "the patient brought up two or three drachms of blood which had escaped into the cavity." It will be remembered that in this operation a long incision was made through the skin and muscles, and the wall of the cavity itself was opened to the extent of an inch, so that a good deal of blood must have flowed.

The trifling hemorrhage referred to as occurring in one of my own cases, took place the very first time I introduced a needle into a lung cavity. I am satisfied that it was connected with the effects of aspiration (for I was employing a Dieulafoy's aspirator), since it has never happened to me again to have the slightest hemorrhage caused, although I have repeated the punctures about twenty-five times upon the same patient, and not less than forty times more in various other cases. It will be further remembered that the puncture only involves the superficial layer of the lung where there are no large vessels, and is called for only in conditions of the lung-tissue where many of the bloodvessels are obliterated. I feel myself justified, therefore, in repeating "that the danger of serious hemorrhage is but slight, if the puncture be carefully performed" (*loc. ant. cit.*).

Thirdly. It has been objected that it is impossible to determine whether adhesion exists between the pleuræ over the seat of the cavity, and that consequently there is danger of allowing the escape of the contents of the cavity into the pleural sac, with the development of pleurisy or pneumothorax. It is true that in rare instances a lung cavity ruptures and gives rise to pyo-pneumothorax; but I believe all authorities will support the statement that for all practical purposes it may be assumed that there are adhesions over every chronic circumscribed superficial lung cavity. Not only so, but there is every reason to believe that, while the passage of the needle itself would, at the most, excite a slight localized plastic pleurisy if the membranes were healthy and non-adherent, the minute puncture of the lung would not give exit to any amount of air or pus capable of causing trouble.

It must be remembered, in performing this simple operation, that it is possible to wound either a vessel or a nerve by failing to regard the anatomical distribution of these structures. Of course it would be necessary in puncturing the chest at any point, just as in ordinary paracentesis, to bear in mind the course of vessels or nerves over that particular region.

In the treatment of lung cavities it will be found that the great majority of punctures require to be made in front, in the three upper intercostal spaces. By keeping as far inward as the nipple-line there is no artery or nerve of any importance exposed to injury. If, however, the position of the cavity should require the puncture to be made much external to this line, it would be desirable to introduce the needle as near the lower border of an intercostal space as it is safe to go without risking any injury of the intercostal artery. I think it probable that if the needle be advanced gradually, a small artery or nerve would be pushed aside and not transfixed. Certainly no accident of the kind has happened in my own experience, extending now over sixty-five punctures. Several times patients have complained of tingling pain shooting down the arm on the affected side, evidently from pricking of some little nervous filament of one of the thoracic branches of the nerves of the brachial plexus. But this pain has always been slight and very transient. In no case has there been the slightest hemorrhage into the tissues of the thoracic wall, or any evidence of irritation caused by the repeated punctures. I append the result of this treatment in the cases of this character in which I have so far employed it.

CASE II. (Case II. in former communication.) *Chronic Phthisis; cavity at left apex, with disease of the lower lobe; repeated injections; temporary improvement; extension of disease; diarrhœa; death.*—John Wilson, æt. 35 years, a Finn, came into the Philadelphia Hospital February 7, 1874. Of a phthisical family, he had had symptoms of lung trouble for nearly three years. For the past three months there had been much acute pain over the left apex, and his other symptoms had been aggravated. He was emaciated and feeble. Physical examination revealed no positive disease on the right side. On the left side there was consolidation of the apex, with a superficial cavity extending from the first interspace to the fourth rib. There were also large and small bubbling râles over the rest of the lung anteriorly and laterally, with some weakness of the respiratory murmur. Posteriorly, above the spine of the scapula, loud bubbling râles were heard; and below, fine mucous râles. He was placed on use of cod-liver oil.

March 8. A delicate needle, attached to an aspirator, was introduced into the cavity to the depth of $1\frac{3}{4}$ inches through the second interspace. A few drops of sanious fluid entered the vacuum, and \mathfrak{m} viij of dilute Lugol's solution were injected. The operation did not cause cough or hæmoptysis, and was followed by no pain, acceleration of pulse, or elevation of temperature.

10th. A delicate canulated needle, with an ordinary hypodermic syringe attached, was passed into the cavity, and \mathfrak{m} xxv of dilute Lugol's solution ($\frac{1}{8}$ strength) were injected. The operation caused neither pain nor cough, and was followed by no irritation or elevation of temperature.

15th. Seemed brighter, and stated that he had been feeling better since the last injection. The cough certainly had been less troublesome. Again injected \mathfrak{m} xvij of same solution. Careful attention was paid to internal treatment and arrangement of diet.

22d. Injected \mathfrak{m} xx of same solution. Appeared to be improving.

A few days after this he felt so much relieved that he insisted upon going out of the hospital to attend to some business. While absent, a violent

storm occurred; he was much exposed, had a slight hemorrhage, severe pain at base of left chest, and on his return on April 3 he was much worse, with increase of cough and expectoration, continued pain and friction-sound at infero-lateral part of left chest.

A blister was applied over this spot, and he was placed upon use of quinia, digitalis, and opium.

For a few days there were evidences of some serous effusion in left pleura; but after this disappeared, coarse friction sound, with signs of rapidly developing consolidation of the lung, made their appearance. There was high hectic fever, and the loss of flesh and strength, which had before appeared to be checked, recommenced. Evidences of disease at the right apex soon made their appearance, and he began to suffer with diarrhœa, which was checked by opium and bismuth.

May 8. The signs of disintegration of the left lung advancing, another injection of dilute Lugol's solution was made into the cavity.

15th. He began to have blood-tinged expectoration, and was ordered vin. ergotæ in fluidrachm doses, and \mathfrak{m} vj of dilute Monsell's solution were injected into the cavity.

24th. Disintegration of the lower part of the left lung still progressed. Injected \mathfrak{m} xx dilute Lugol's solution into the cavity. Contraction of the upper part of left thorax had become more marked, and the heart was displaced upwards and to the left.

30th. Diarrhœa returned, and proved very difficult to control, causing extreme prostration. Soon after the discharges were controlled, increased hectic, cough, and expectoration appeared.

July 30. Since last note the condition of this patient has fluctuated, but on the whole has become worse. No further injections have been made. The cavity *appears* to be somewhat contracted, but the disease of the remainder of the lung and of the right apex has progressed so rapidly as to indicate a speedy termination.

August 14. He continued to sink, and died to-day, worn out with protracted diarrhœa.

At the *post-mortem* the *right* lung was found enlarged, tightly adherent over the upper lobe. On section, the whole of this lobe was in a state of cheesy infiltration, with several points of softening. Scattered through the middle and lower lobes there were crude yellow granulations. The anterior border encroached greatly on the mediastinal space. The *left* lung was much contracted, and throughout tightly adherent by dense white fibroid tissue, which formed a complete casing for the lung. On careful examination of the area through which the punctures were made, it was impossible to detect any trace of the passage of the needle. An incision was made into the upper lobe, which was almost entirely occupied by an anfractuous cavity. The anterior wall of the cavity was largely composed of pure fibrous tissue in places varying from $\frac{1}{12}$ to $\frac{1}{8}$ of an inch in thickness, with a small amount of lung tissue in a state of fibroid induration. The cavity was divided into sacs by various imperfect septa. The largest of these sacs lay upon the anterior part of the lobe with a fibroid wall not more than $\frac{1}{8}$ inch in thickness, and had been entered by the various injections. The lining membrane of this sac throughout was smooth, shining, and whitish, and entirely free from any cheesy formation. In other parts of the cavity there was a small amount of cheesy matter adherent to the walls. There was very little secretion in the cavity. The lower lobe was in a state of mixed fibroid and cheesy induration, with

here and there small centres of softening. The pericardium was tightly adherent to the concave surface of the left lung. The pericardial sac contained 8 ounces of turbid serum, but there was no appearance of inflammation. There were a few milky spots on the pericardium. The bronchial glands were greatly enlarged and in a state of cheesy degeneration. There was extensive ulceration of small intestine, and to a less extent, of the large intestine. The liver was fatty.

In this unfortunate case the injections were undertaken rather with the negative view of demonstrating their harmlessness than with any definite expectation that they would prove serviceable. The symptoms for three months before the patient came under observation indicated a rapid progress and extension of the disease, and when first examined, it was found that the entire left lung was hopelessly involved. Still the repeated attacks of pain which had been experienced about the left apex made it almost certain that the pleuræ were adherent over the seat of the cavity. And in fact it resulted that the injections which were practised (seven in all) did not cause the slightest irritation nor leave any trace that could be detected on post-mortem examination. The course of such cases is altogether too irregular to allow the slightest significance to be attributed to the temporary improvement which followed the first four iodine injections. It is true that the portion of the cavity into which the injections were directly thrown, presented an unusually favourable appearance, but no distinct contraction could be detected. All that can be safely deduced is that they were perfectly tolerated, and that they might have been safely continued had not the progress of the disease been precipitated by an intercurrent attack of pleuro-pneumonia from exposure, and by the supervention of intestinal ulceration.

The amount of blood in the expectoration, May 15, was too slight to allow any conclusions to be drawn as to the effect of the single injection of Monsell's solution.

CASE III. *Hæmoptysis; Chronic Phthisis with large circumscribed cavity at right apex; injections of Iodine.*—Thomas Peyton, colored, æt. 46 years; admitted to the Philadelphia Hospital May 1874. Enjoyed good health until June 1872, when, while working, he had a severe hæmoptysis, followed by two others in course of twenty-four hours. This was followed by cough and dyspnœa, with abundant purulent expectoration. He lost flesh rapidly at first, then recovered somewhat and returned to work in the course of two or three months. He had two or three small hemorrhages subsequently, but continued to improve until the summer of 1873, when he was obliged to quit work for a few weeks, after which he resumed it and continued until May 1874, when he was obliged by dyspnœa to abandon it and enter the hospital. He has usually kept in pretty fair condition; has enjoyed good appetite; had night-sweats in 1873, and again since admission. On admission there were undoubted physical signs of a large superficial cavity with thick walls at the right apex, reaching down to the third interspace. He was placed on use of the following mixture: quiniæ sulph. gr. xxiv; acid. sulph. dil. f3ij; inf. gentianæ comp. f3vj; ft. sol. S.—Tablespoonful thrice daily in water.

20th. A delicate canulated trocar was passed through the second intercostal space into the cavity, and m_{xxx} of dilute Lugol's solution (one-eighth strength) were injected. No unpleasant symptoms attended the operation.

27th. The same injection was repeated. The patient was very nervous, and said it increased the rheumatic pain in his back; no further injections were practised.

July 25. The patient has continued in the hospital, and has used steadily the prescription given above. He has improved considerably, coughing but little, and suffering less from dyspnœa. The physical signs remain as before, save that there is increasing contraction at right apex, and evidence of very little secretion in the cavity.

In this case, also, the size, duration, and superficial position of the cavity rendered it highly probable that the pleuræ were closely adherent over its site. The injections did not produce a single unfavourable effect. The pulmonary symptoms improved steadily, though slowly; but it is difficult to say how much, if any, influence should be attributed to the intra-pulmonary injections which were only twice employed.

CASE IV. *Chronic Phthisis, with large circumscribed cavity at right apex; Incipient disease at left apex; Repeated injections of Iodine; Marked improvement* (Case I. in former article).—W. S., æt. 29, has a strong hereditary disposition to phthisis, having lost his father, mother, and one brother with that disease. He is markedly chicken-breasted, and lame from severe coxalgia. He has been a metal-polisher, and was attacked with cough in August 1872. In October 1873, he had hæmoptysis, after which he failed rapidly; lost flesh and strength; had marked hectic and dyspnœa. There was much pain over the right apex, troublesome cough and abundant purulent expectoration.

There was no recurrence of hæmoptysis, but his condition remained about the same, with occasional fluctuations, until the early part of the present year, when he suffered severely with increased cough and hectic. On February 17, 1874, his condition was found to be as follows: He is much emaciated, and is very easily fatigued. There are no marked digestive symptoms. His breathing is very short, and this is much increased by exertion, so that it is difficult for him to ascend a single flight of stairs. His cough is painful, exciting pain especially on the right side of the chest, but is not very severe at present, and is attended with but a moderate amount of purulent expectoration. The frequency of the pulse is somewhat variable; at present it is 108.

Upon physical examination there is on the left side some roughness of the respiratory murmur, and a few crackling sounds at the apex.

On the right side there is tympanitic resonance, even on light percussion, from the clavicle down to the fifth rib; the most marked (amphoric) tympany is heard at the middle of the second interspace. There is cracked-pot sound for two and a half inches to the right of the sternum from the second to the fifth rib. Auscultation reveals blowing breathing on inspiration and expiration over this whole area—the character of the blowing, however, varying at different points. Over the seat of cracked-pot sound it is very superficial and is rather shrill and high-pitched, and accompanied with large, moist, and gurgling râles. Outside of the line of the nipple it

is larger, lower-pitched, and free from râles. There is intense pectoriloquy over this entire area.

His treatment has been very varied, but without any permanent relief, and the course of the case has been gradually downwards.

On February 24th, the No. 1 needle of Dieulafoy's aspirator with the syringe attached was introduced in the second interspace on a line with the right nipple to the depth of $1\frac{7}{8}$ inches, and was followed by the escape into the vacuum of a few drops of offensive watery pus. About miv of a very dilute Lugol's solution ($\frac{1}{30}$ strength) were then injected through the canula by a hypodermic syringe.

The operation was followed by loose, rattling cough, and the expectoration of about three fluidrachms of fresh, frothy blood. He was immediately put to bed, and the cough and hemorrhage soon stopped. His temperature in the evening and the following morning was only 99° F.

28th. The injection was repeated in same manner, mij of iodine solution of double former strength being used. There was tingling pain down the right arm while the needle was in place, but no other symptoms attended or followed the operation.

March 5. Since the last puncture, he has been feeling very comfortable. There has been no hectic; the cough is less severe, the sputa more scanty and whitish. He is bright and cheerful, and states that his dyspnoea is greatly relieved. The same needle was introduced to the same depth at a point one-eighth of an inch nearer to the sternum. The puncture was immediately followed by a rapid flow of fresh, frothy blood into the vacuum, about one and a half fluidrachms escaping. The pump was detached, and ten minims of iodine solution were injected. He was put to bed immediately, but scarcely any cough and no hæmoptysis followed.

8th. The patient is brighter and more cheerful than for months past. There is no hectic irritation, the temperature never rising above 99° or 99.5° . The pulse ranges about 84. His breathing is so much relieved that he has walked up three long flights of stairs without much dyspnoea. His weight is now 107 pounds. The cough is but little troublesome, and only a few white, frothy sputa are raised. Auscultation shows that many of the râles formerly heard over the right apex have disappeared. There has also been some increase in flesh. All internal medication was now discontinued.

Before this he had been taking cod-liver oil, a pill of quinia, digitalis and opium, and a sedative cough mixture.

10th. Twenty minims of same solution were injected at a spot a little outside of the former puncture. The aspirator no longer used. A strong iodine taste was immediately perceived.

15th. Fifteen minims of same solution injected. During the past week he has had more cough and expectoration, and has felt weak and chilly; partly on account of very low temperature in ward, partly on account of the withdrawal of internal medication.

22d. Twenty minims of same solution injected; no unpleasant results.

30th. Fifteen minims of a stronger solution (Lugol's solution m x to $\text{f}\text{3j}$ of tepid water) injected.

April 3. Not feeling so well; increase of cough and expectoration and hectic fever. Also suffers from indigestion. Was ordered quiniæ sulph. gr. ij t. d. also strychniæ sulph. gr. $\frac{1}{30}$; acid. nitro muriatic. diluti m x ; liq. pepsin $\text{f}\text{3j}$ t. d.

9th. Injected m xxv of Lugol's solution (one-seventh strength).

10th. Slept well last night and feels a great deal better ; has had hardly any cough. Weight 109 pounds.

17th. Injected m xv of same solution. Bowels costive ; ordered laxative pill of colocynth and belladonna. The acid tonic mixture ordered on the 3d now stopped ; quinia to be continued ; and *mist. ol. morrhuæ cum calceis lacto-phosphatis* $\text{f}\overline{\text{ss}}$ t. d. ordered.

25th. Injected in same manner.

May 3. Repeated same injection. Patient improving. Is able to sleep well. Has no hectic. Coughs very little, and expectorates purulent matter in moderate amount. Is out every day walking over a mile.

8th. Injection repeated with m xxv of Lugol's solution (m xij to m xlvij of warm water). Weight increased to $111\frac{1}{2}$ pounds.

Same injection repeated May 15th, 24th, and 30th ; and June 5th and 14th. On introducing needle at usual spot in second interspace, the point was evidently imbedded in dense tissue instead of entering cavity. This has been growing more and more marked for some weeks past. The injection entered with difficulty and only m xv were introduced.

June 21st and July 1st m xxv of same solution (1 to 5) were injected in second interspace, three-quarters of an inch outside of nipple line.

6th. Repeated injection, and found difficulty in forcing fluid in, so that only m xij were injected. Continues to improve, although a good deal affected by the hot weather. Expectoration very scanty, not more than $\text{f}\overline{\text{ss}}$ daily.

15th. Still more difficulty experienced and only m vij injected. This is evidently owing to increased development of fibroid tissue in wall of cavity leading to thickening and contraction.

21st. Injected m xxv in first interspace in the line of the nipple without any difficulty ; severe tingling pain coursed down right arm for a few moments.

August 17. No injection since last date, owing to my absence from the city. For past three or four days, he has had some catarrhal irritation, in consequence of imprudent withdrawal of his underclothing. He has continued in fair condition, with very little cough and expectoration. He has for several months spent the greater part of every fine day out of doors, walking considerably. There has been scarcely any hectic fever, as indicated by the thermometer. He has gained flesh slightly ; appetite and digestion good. The physical signs indicate no extension of disease in left lung. There is increased contraction at right apex. On percussion, there is marked diminution in the cracked-pot sound ; and tympanic resonance is less superficial and readily developed. There is still marked blowing breathing and pectoriloquy ; but respiration is accompanied with much fewer râles than formerly.

In examining this history, I think it will be granted that it was far from being a favourable case for treatment, when we add to the marked family tendency to phthisis and the previous scrofulous affection, the advanced disease of the right lung, and the incipient trouble at the left apex. And yet it is unquestionable that during a period of six months, in which time twenty-three injections have been made, there has been a progressive improvement both in the general and local conditions. He has gained a few pounds of flesh, but has gained vastly more in vigor and power of exercise. His spirits and morale have greatly improved. Cough has

almost left him, and the expectoration is very trifling. There has been very slight progress in the signs of disease at the left apex, while there has been an evident contraction of the large cavity at the right apex, as shown by the greater retraction of the ribs, and the increasing displacement of the heart towards the right side, as well as by the increased resistance to the introduction of the needle.

CASE V. (Case III. former article.) *Chronic Phthisis of Right Lung with large Cavity at the Apex; repeated injections of Iodine; Improvement.*—James Hill, æt. 27, was admitted to my ward in the Philadelphia Hospital. His father died of phthisis; he himself enjoyed good health until November, 1871, when he had an attack of rheumatism. In April, 1872, he began to be troubled with cough and pain in the right chest; the cough was at first dry, but later has been accompanied with purulent sputa. He first spat blood in July, 1872, and since then he has had quite frequent small hemorrhages. He has suffered much from pain in various parts of the right lung. He has had comparatively little hectic fever, but has lost much flesh and strength.

He was obliged to give up work in November, 1873. His weight on admission was $117\frac{1}{2}$ pounds. Marked dyspnœa on exertion, pulse 120 when quiet.

Physical examination shows contraction and comparative immobility of the right side; enlargement of the left side, with slight curvature of the dorsal spine, and deviation of the sternum. The left lung is hypertrophous and healthy. There are the physical signs of a quite large cavity at the right apex, with marked thickening of the pleura and induration of the lung below. The apex-beat of the heart is just to the right of the sternum.

Over the right infra-clavicular space, down to the third interspace there is deep-seated tympanitic resonance, which on strong percussion is amphoric with slight cracked-pot sound; cavernous breathing, both in inspiration and expiration, with bubbling râles with amphoric echo, and marked pectoriloquy for the spoken and whispered voice. On March 8, the No. 1 aspirator-needle was introduced in the second right interspace a little outside of line of nipple to the depth of one and seven-eighths inches, and evidently entered a cavity. About seven minims of dilute Lugol's solution were injected. The operation produced a paroxysm of spasmodic cough, but was followed by no hæmoptysis or irritation. On the following day there was a little blood-stained expectoration, such as he frequently had.

March 15. Repeated same injection, using $\text{m} \text{ xv}$.

22d. Injected $\text{m} \text{ xx}$ of same solution.

April 9. Injected $\text{m} \text{ xxv}$.

10th. Has been taking much subnitrate of bismuth and pepsin for his dyspeptic symptoms. Now ordered syr. ferri iodidi gtt. xv t. d.

17th, 25th, and May 3. Again injected $\text{m} \text{ xxv}$ of dilute Lugol's solution (1 pt. to 7 of tepid water). He has gained $6\frac{1}{2}$ lbs. since admission.

May 8, 15, and 24. $\text{m} \text{ xxv}$ of stronger solution (1 part to 5 of water) were injected. Not the slightest inconvenience has followed any of the injections.

30th. Injected $\text{m} \text{ xvij}$ of this last solution in the third interspace.

June 5, 14, 21, and 29; July 6, 16, 21, and 28. Repeated same injection, but in second interspace as formerly.

August 17. On my return to the city, I find him in bed with a marked attack of purpura. He has been ordered fresh vegetables and fruits freely,

and is getting well of it rapidly. His general condition is favourable. There is very little cough or expectoration, and the physical signs indicate a tendency to still further contraction of the right chest, especially at the apex. The heart's action is still excited. Until the development of the attack of purpura he has been able to exercise freely out of doors. No injection since last note.

In this case, as in the former, the prognosis was rendered unfavourable by the large size of the cavity and the implication of the rest of the lung, as well as by the hereditary predisposition of the patient, the frequent recurrence of hemorrhage, and the marked emaciation, dyspnœa, and prostration. On the other hand, the tendency of the disease to assume a fibroid form, and the evident attempts at compensation in the retraction of the chest, the hypertrophy of the left lung, and the displacement of the heart were favourable elements of prognosis. Still it will not, I think, be doubted that the progress of the case has been exceptionally favourable; so that, while it is very certain that the local treatment above described was not in any way injurious, it is altogether probable that it has been productive of good in favouring contraction and cicatrization of the cavity.

CASE VI. Chronic Phthisis; frequent Hemorrhages; large Cavity at Right Apex; Repeated Injections of Iodine; Marked Improvement.—W. E., æt. 43, a tall and heavily-built man, a labourer, of very intemperate habits, was admitted to the Philadelphia Hospital 19th March, 1874. His father and one of his brothers died of phthisis; the rest of the family are very healthy. He had several attacks of gonorrhœa, and one attack of syphilis, followed by very mild and transient secondary symptoms. He was very much exposed in consequence of his work and intemperate habits, but was not subject to catarrh. Had severe attack of typhoid fever in spring of 1870. In the fall of that year, cough began with expectoration of muco-purulent matter, occasionally containing small proportion of blood. In October and November he had frequent large hemorrhages; dyspnœa became marked, and he lost flesh and strength rapidly. He gave up work then and has been able to do very little since. Since then his condition has fluctuated from time to time. During summer of 1873 he had a good deal of purulent expectoration and occasional hæmoptysis, but had some periods of comparatively good health. At beginning of the fall he lost flesh and strength still further, and entered the hospital in October. He went out in January and returned in March. At that time, his weight was 149 lbs. His dyspnœa was extreme, and he had great difficulty in going up stairs. Cough was very troublesome and attended with abundant blood-tinged expectoration.

On physical examination, the thorax is rather narrow with increase of antero-posterior diameter. The apex beat of heart is in fifth interspace just within left nipple. No clubbing of fingers. Enlargement of capillaries of nose and cheeks.

At the right apex there is large tubal tympanitic resonance over inner two-thirds of infra-clavicular space, and over the outer third dulness on percussion. Posteriorly there is dulness down to a little below spine of scapula. At left apex the percussion resonance is a little higher-pitched than normal. Elsewhere it is normal.

Auscultation at right apex reveals loud, dry, cavernous breathing down

to third rib anteriorly, and, over third interspace, moist crackling with prolonged expiration. Posteriorly there is large blowing breathing over apex. Below, respiration is normal anteriorly and posteriorly. There is distinct pectoriloquy over the infra-clavicular and supra-spinous spaces. At left apex anteriorly, there is feeble respiratory murmur, with dry crackling over upper lobe anteriorly. On palpation the vocal fremitus diminished all over thorax; same at right apex. He was ordered cod-liver oil and a cough mixture containing cyanide of potassium.

April 9. His condition appeared stationary. He suffered much from dyspnoea, weakness, and cough. An injection of m vi dilute Lugol's solution (1 part in 10 of water) was made into the cavity through the second interspace in line of nipple. This was followed by a severe spell of coughing, lasting an hour, and requiring chlorodyne for its relief.

17th. Injected m xv of same solution. Has had rather more cough than before first injection.

25th. Same injection repeated.

May 3, 8, 15, and 24. Injection repeated, using m xv to xx of solution varying from 1 part Lugol's solution to from 9 to 6 parts of warm water. His weight increased 11 pounds, to 160. Better in every way; cough greatly relieved; has had no blood-stained sputa for some time. Is now able to walk considerable distances.

June 5 and 9. Same injection repeated.

21st. Injected m xxv of Lugol's solution (1 part to 5).

June 29 and July 6. Injections caused some pain owing to difficulty in introducing fluid, apparently owing to increased induration and contraction of tissue at point of puncture.

July 8. Injected m xxv of same solution in first interspace in line of nipple, without slightest difficulty, and with production of no cough or pain. The needle was introduced $1\frac{5}{8}$ inches.

16th and 21st. Repeated same injection at same point.

August 17. Owing to absence from the city no injection has been made since last date. For the past two or three months has spent almost the entire day in the open air, his strength has been increasing, and he now walks as much as five miles a day without fatigue. His breathing has become much easier; is able to carry a bucket of water up to the third floor without dyspnoea. For the past eight weeks his cough has been rapidly decreasing and during the past month has ceased, and there has been no expectoration. There is an entire absence of hectic fever. His general appearance is excellent, and his appetite and digestion are good.

The right apex is motionless during respiration; there is no increased contraction of right apex; tympanitic resonance is less distinct, it being best marked over inner half of first and second interspaces. There is large diffuse blowing over outer part of first and second interspaces, which toward sternum becomes almost cavernous. There is less dry crackling over the left upper lobe with improved respiratory murmur. He continues to take cod-liver oil and two ounces of whiskey daily, but needs no cough mixture. To-day repeated the same injection through first interspace.

In this case, also, although a more favourable prognosis was justified than in the two last ones, it must not be forgotten that the patient's condition, when the use of injections was begun, was worse than at any previous time, and that evidences of incipient disease of the left apex had

made their appearance. The improvement which has taken place during the continuance of the local treatment is very positive and gratifying, and shows itself by disappearance of cough and expectoration, by entire cessation of hæmoptysis, by relief of dyspnoea, and by gain in flesh and strength.

The momentous importance of determining the actual clinical value of any mode of treatment which claims to be of use in pulmonary phthisis, forbids any rash conclusions drawn from insufficient data. In March last I stated that "the practical value of this mode of treating pulmonary diseases is as yet uncertain." Subsequent experience, although by no means sufficient yet to justify a claim of curative powers for it, has certainly strengthened its position. In the first place, it is evident from the record of cases here published that the injections of iodine reach the lung cavity and exercise a decided action upon its lining surface. This is shown by the depth to which the needle is introduced, by the strong and unmistakable taste of iodine frequently perceived after the injections; and by the paroxysms of cough caused by the first injections in each case. It is evident also that this action proves not only to be unirritating, but to tend to a diminution of the morbid sensibility of the cavity walls, and to a healthy modification of the cell-action there. This is shown by the fact that, although the amount and strength of the injections have been considerably increased, in each case they have ceased to produce any cough. It will be remembered that in the earlier injections very small quantities (m iv to vij) of very weak solutions (Lugol's solution m ij to iv to f3j of water) were used, but they have lately been increased to m xxv of a mixture of 1 part Lugol's solution and 5 parts of warm water. It may be doubted if the small and feeble injections at first employed could produce any marked effect upon the lining surface of a large cavity; but this power will scarcely be denied to the much larger and stronger injections lately used. Their action further appears to be beneficial, and the modification of the cell-action in the walls of the cavity to be in a healthy direction, since during the continuance of this treatment there has been in each case a marked improvement in the soreness about the cavity, and, even more markedly, in the amount of cough and expectoration. I do not think that the evidence afforded is yet sufficient to prove that these injections have led to partial cicatrization and contraction of the cavities; but the improvement in the physical signs carefully noted above, certainly seems to indicate it. If they succeed in effecting this, it will presumably be by so modifying the cell-action in the walls of the cavity as to lead to a production of more healthy lymph capable of developing into fibro-cellular tissue, limiting the enlargement of the cavity, and ultimately by its organization and contraction tending, in conjunction with other agencies, to diminish its size. It must be noted that in two cases (IV. and VI.) the increasing density of the tissue through which the needle had been passed, and the increasing difficulty of effecting the injection at the original spot, would

seem to point to this change in the walls of the cavity. This question must, however, be settled by more prolonged observation.

It is finally evident that, if these injections are capable of disinfecting the contents of a lung cavity, and of so modifying the morbid action in its walls as to diminish the suppuration, they may be of the greatest value by lessening hectic irritation, and further by diminishing one of the greatest dangers of chronic phthisis, the liability to constitutional infection, and the development of diffuse miliary tuberculosis. It may be maintained in opposition to all here advanced that the favorable changes in the three cases last reported (IV., V., and VI.), are accidental and temporary, and merely such as are seen from time to time in the course of many cases of chronic phthisis. I can only vouch for the clinical records as presented; and call attention to the facts that these three cases were doing badly, despite careful internal treatment, until the beginning of the use of intrapulmonary injections; that since then their improvement has been such as would be rather surprising in a single case, but much more remarkable in three unfavourable cases treated simultaneously under rather unfavourable circumstances; that the course has been uniform in all the cases, and marked by the same changes; that it has been attended with positive improvement in the physical signs; and that this steady gain has seemed to the patients themselves, and to all who have watched them, to be directly connected with the treatment employed.

In concluding our study of this question the following points appear to have been established:—

1. That the idea of opening lung cavities by an incision through the chest-walls is at least as old as Baglivi (probably much older); but that, owing to the very imperfect character of early clinical records of thoracic diseases, it is difficult to show that such an operation was actually performed before the last century (Barry), or more probably the present one (Hastings and Storks).

2. That the idea of conducting continuous treatment of such cavities by local applications made directly through the chest-walls, has been seriously entertained only within the past few years.

3. That the possibility of puncturing the lung in a state of health with delicate needles without injury, was demonstrated in a few instances by the advocates of acupuncture; and more recently, in the lower animals, by Koch and others.

4. That the operations of Storks and Mosler have shown that lung cavities are very tolerant of external interference, and that they may be cut down upon and opened, canulæ introduced and retained, and various medicinal agents injected in solution or spray (Mosler).

5. That the independent observations reported in full in this paper have shown that the continuous treatment of lung cavities by repeated injections by means of delicate canulæ may be conducted without pain, hemorrhage,

traumatic irritation, or interference with internal medication and hygienic measures.

6. That the cases which are best adapted for this local treatment are those where a single, superficial, and circumscribed non-tuberculous cavity exists; but that even when there is implication of the rest of the lung, or incipient disease of the opposite lung, some benefit may be expected.

7. That the mode in which such local treatment does good, is chiefly by altering the character of morbid action in the walls of the cavity, diminishing the amount of purulent formation, as well as the degree of hectic irritation and the danger of constitutional infection. That a certain amount of rest for the walls of the cavity is secured by the marked relief afforded to the cough. Also that it is indicated, by the progress of the cases above reported, that this treatment may favour the cicatrization and contraction of such cavities.

8. That in the cases in which it has been employed (in which over seventy injections have been given), it has shown itself free from all danger, and of a *certain degree of positive clinical value*, since, during its use, uniform improvement to an exceptional degree has taken place in both the general and local conditions of the patients.

ART. II.—*Post-Paralytic Chorea.* By S. WEIR MITCHELL, M.D.,
of Philadelphia.

I HAVE long had in mind to call attention to the mode in which various forms of neural disturbance may succeed one another, seeming to grow out of degrees, or, at least, out of variations of one common parent cause. A well-known sequence is the passing of chorea into hemiplegia, or, more rarely, into a curious double hemiplegia.

It is not so well known, perhaps, because it is so rare, that a curious but noticeable one-sided awkwardness of movement is in some cases the precursor in children of a hemi-spasm.

In such a case, well known to me, the child was considered for some days to have incipient chorea on the left side, and had indeed all of the peculiar awkward ways of that disease. It increased during a week, and then ended in convulsions, beginning and closing with pure left hemi-spasm.

In a case, lately brought to my clinic in a state of protracted hemi-spasm, there was said to have been the same previous condition, and the doctor who saw it considered it to be chorea.¹ I have in like manner seen

¹ The spasm in this case I at once relieved by nitrite of amyl, and the child went into a quiet slumber. Nitrite of amyl has passed long since into familiar

the hand of a clerk, incapacitated for using the pen, at one period by cramp, at another by choreal disturbances, and lastly, by intense pain, that is, at different times these three symptoms were observed as a result of excessive use of the pen.

The sequence of loss of power following chorea has been amply seen and fully described, but, if I am not mistaken, the fact that organic palsies, especially hemiplegia, are occasionally followed by hemi-chorea, or a still more limited local development of that disorder, is, I think, less well known. In briefer language, as there is a post-choreal paralysis, so, also, is there a post-paralytic chorea. The propositions which I desire or hope to prove are these :—

That on adults who have had hemiplegia and have entirely recovered power, there is often to be found a choreal disorder, sometimes of the leg and the arm, usually of the hand alone. That it may exist in all degrees, with partial loss of power, and with full normal strength. That it may consist in mere awkwardness, or exist to the degree of causing *involuntary* choreoid motions of the part.

I hope also to show that the younger the person when paralyzed, the more probable is the occurrence of choreal developments, so that in many cases of infantile deformity the choreal troubles remain as the chief difficulty long after there has been a restoration to full muscular power.

I have reason to believe that some of the general and prolonged choreoid disturbances which we see now and then from birth, are due to, or, rather, are in some fashion related to, intra-uterine palsies which have either wholly or in part passed away.

If these propositions are correct, or even the first two, they will prove that choreoid affections may be owing to gross organic lesions, and that under certain favouring circumstances, the same lesion which occasions a palsy may in itself, or in the disturbances it causes, also bring about chorea. It is quite plain that the post-paralytic chorea is rare, but less so than I used to think. It is not found well marked in cases of palsy which remain much enfeebled. One may see cases of nearly absolute extinction of movement, whose actions are quite free from any lack of guidance, devoid of all uncertainty, save that which comes of loss of power. Nor is this acquired awkwardness which is left by some of the better recoveries from palsy altogether sudden; on the contrary, where I

use at this hospital, and, indeed, is looked upon by many physicians in America as the best of all the immediate anti-convulsivants. It was first used with success in convulsions by me in 1871, and my results were published in April, 1872, in the *Philadelphia Medical Times*. A very important case, in which it proved of singular value, was soon after reported in Brown-Séquard's *Archives*, by Dr. Wharton Sinkler, and it was, at my suggestion, next used with success, by Dr. Jenks, in eclampsia. I am glad to see from recent reports that it is beginning to attract attention in England.

have been able to study it, it has seemed to grow slowly, increasing as the paralytic state faded out. It appears in such cases to be owing to some tardy and chronic change about the seat of the clot or embolus; but as to this I hesitate to speculate further, believing that, having thus called attention to these facts, they will in future be more often found and more fully studied.

CASE I.—The following case I attended in the first attack of hemiplegia, and saw many times afterwards. Since it is the only case which ended in death, I give it the first place. The following notes are Dr. Sinkler's report of the case to the Philadelphia Pathological Society:—

The patient was a man 47 years of age, single, who for some years had been employed in the post-office as letter-carrier and clerk. For twelve years he had served in the British army in India, and during the late war he was in the United States Army. He had always enjoyed good health, and was temperate in the use of tobacco and liquor. He had never suffered from any constitutional malady.

There was no cardiac disease, nor were there any atheromatous changes in the radials.

December, 1871, he had an attack of left hemiplegia. The paralysis was not absolutely complete, he being able to move slightly the hand and foot, and in about six months was able to return to light work. He could walk fairly well at the end of this time, could use the arm to some extent, and there was no contraction of the flexors on the paralyzed side.

For several months he continued to improve. Once, however, he had an attack of vertigo, which was followed by an increase of weakness for a few days.

Rather more than a year after the first attack he had a second. He did not become unconscious, but he was extremely difficult to rouse. The face was flushed, the breathing stertorous, and the speech thick. He complained of intense pain in the head. The loss of power was on the right side, but it was not so complete as it had been on the left side in the previous attack. There was no facial palsy. It was two or three months before the patient was able to walk even a few steps. The muscular power of the limbs seemed to have returned, but the difficulty was in co-ordination. The power of locomotion in time returned to some extent, but he was never able to walk any distance, even with assistance. His gait was uncertain, and if his attention was called to anything while he was walking he was liable to fall. In fact, there was a sort of choreic condition of the limbs which was induced when voluntary effort was made, and unless he carefully observed his movements he tottered or fell.

During the next few months he had several attacks of vertigo, followed by severe pain in the head, loss of appetite, and obstinate constipation. After these attacks there was always increased difficulty in walking. For several months before death the expulsive power of the bladder became weakened, and urination was often delayed many hours.

On May 7, 1874, while sitting on the commode and endeavouring to urinate, he suddenly fell forward unconscious. He was caught, however, before striking the floor. There were no convulsive movements, but the body became rigid and the eyes were rolled up. Consciousness returned in a few minutes, but on recovering he felt as if he were choking. He could not swallow, and respiration was laboured. Speech was thick and almost inarticulate. For a few days before this he had been unusually heavy and inclined to sleep most of the time. In a few hours he was able to take into the stomach some liquids; but the next day the inability to swallow returned, and the respirations became more frequent and difficult. The bladder was emptied by the catheter, and the urine examined and found to be free from albumen.

His condition from this time grew steadily worse. The surface became congested from insufficient aeration of the blood, everything that was attempted to be swallowed was regurgitated through the nose and mouth, and the patient died on May 12.

There was no increase of paralysis in the extremities, and consciousness remained almost to the last.

Post-mortem forty-eight hours after death. The body was in a good state of preservation, having been kept in ice. The veins of the scalp were full. The skull was brittle, a corner breaking off when the calvarium accidentally dropped on the floor. Dura mater not unusually congested. In the superior longitudinal sinus was a firm white clot extending almost its entire length. The arachnoid was opaque over its convexity, but was more especially so at the base. A white clot occupied the right internal carotid. The vessels of the circle of Willis were enlarged and extensively atheromatous. The right middle cerebral artery was almost double the normal size, and stiffened with atheromatous changes; the left was in very much the same condition, and in the under surface of the middle lobe, where the vessel rested, was a spot of softening the size of a pigeon's egg. On section of the brain, the puncta vasculosa were prominent and some serum exuded. There was a moderate amount of fluid in the ventricles. In the left corpus striatum was a patch of softening as large as a filbert. No change in the right. In the right crus cerebri was a small spot of softening, which presented a dark color with many almost black points. A fragment of this was kindly examined by Dr. Tyson, who found only pigmented cells and no hæmatoidin crystals. There were adhesions and recent lymph in the right pleura, and the base of the right lung was somewhat congested. The liver and kidneys were gorged with blood, but otherwise healthy.

This case is in many ways valuable here. In the first hemiplegia, which was on the left, he was delirious or insensible for two days, and very slowly but very completely recovered power. In fact, he became so well that there was but slight difference in the force of the left or the right grasp, or in that of the separate fingers. I think that he had at this time in the left hand a remarkable awkwardness, but as to this I am not absolutely sure, for I was not then so attentive to this point as I have since become. His attack was on Dec. 24. Jan. 20 I stained his finger nails on both sides. No growth took place on the left side for two weeks, and up to April the left growth was one-half that of the right. About March 10 he had one of those strange attacks of arthritis which Charcot and myself and some others have described. In this case it was sudden and acute, and involved every joint of the left (palsied) arm, there being elsewhere no pain or swelling. I have never seen a more remarkable case of post-paralytic arthritis. It grew well very slowly, but became more completely well than is usual in such cases.

Then came the second hemiplegia (right side), not so profound an attack. In neither was there loss of sensation. Again he recovered full power. The amount of it restored was indeed notable, but as the reporter states, despite his strength, which seemed to be amply sufficient to enable him to walk, he had a disorder of movement which Dr. Sinkler, whose attention I had often called to such cases, looked upon as deserving the name of choreic. It was so extreme that all the man's attention was needed to enable him to walk, but it was not eyesight that was thus needed, but concentration of will to regulate motion. He walked as well in the dark as in the light.

This patient had no involuntary or spontaneous movements, no motor

disturbance until voluntary acts were attempted, when they at once became irregular; those of the hand were, as I recall them, so striking, that they possessed every clinical peculiarity of the chorea of childhood.

The lesion mentioned in the report as a small spot of softening in the right crus cerebri was, I suspect, the site of a former clot. The general and most extreme changes in the intra-cranial vessels, with almost utter absence of atheroma outside of the head, strike me as clinically curious. The great amount of lesion in this interesting case makes any further pathogenetic analysis of symptoms unprofitable; but it may come to be read more clearly in the light cast by the future cases which I shall here relate.

CASE II. Hemiplegia; repeated attacks; post-paralytic chorea, with automatic choreal movements.—M. H. S., æt. 38; no children; married sixteen years; has had no syphilis or rheumatism. She presented herself at my clinic January 28th, 1874, and gave me the following account: In June, 1872, she was taken in the street with partial loss of power on the left side. It involved the left face. The following night she was delirious—screaming and laughing—being in great measure conscious, but unable to control herself. The leg proved to be but slightly affected, the hand not severely; but for four days she was unable to say what she wanted, but was able to make signs and to write. For a week the face was drawn to the right.

In July, 1872, she had a second attack on rising in the morning. This time she lost all power to speak for twelve days. There was no wrong use of words on recovery, but simple and complete loss of speech, and ever since a certain thickness of utterance. No loss of consciousness, but entire loss of motion on the whole left side. Again recovery was rapid, and in seven weeks she could walk, and use the arm well. On the 11th of January she had partial loss of power in the right leg, and later in the day of the right arm; also there was some twitching of the leg, and an increase of the facial (left) palsy, which had never improved as much as the limbs. In a few days she became much better, and within a fortnight ceased to drag the foot.

The face is still decidedly drawn to the right; the heart-sounds normal; urine healthy; menstruation regular; the eye-grounds are absolutely normal; no headache or vertigo.

The movements of the right side are strong; the grip equal by dynamometer, but there is a curious and indescribable awkwardness of leg-action on the right, and the right hand movements are simply choreic. The effort to pick up, or take any small object, results in contractions and slow extensions of the fingers, which also separate from one another, and the effort results in failure, either from falling short of or from passing by the object aimed at; with this, there are, at each effort, twitches of the right face, and excitement seems to increase all her motor difficulties. When not willing an action, her fingers, like those of a bad case of chorea, are constantly in movement, shutting, opening, separating, but these motions cease during sleep.

The treatment used proved of little value.

The choreal character of this case was complete, and it could have been cited or shown to a class as a type case of unilateral chorea.

CASE III.—My next case, W. H. E., æt. 65, is taken from the rich note books of my clinic, at the Infirmary for Nervous Diseases. It is not so precise a case as the last, but is interesting for its differences and peculiarities.

This man, well up to March, 1869, was first seized with numbness in the ulnar nerve tracks (right). Then he felt a sense of lack of power to direct the legs, and within an hour, having no loss of consciousness, he was attacked with entire loss of motion and sensation on the right side. For several days he could not speak at all. Motion returned slowly, so that he can walk fairly well, and use both hands.

I saw him in February, 1872, and then found the following remarkable symptoms: He had loss of sense of touch, pain, and temperature, on the whole right side, including the tongue and mouth. He had a constant stinging and burning pain at places, which shifted anywhere or everywhere in the side affected. Movement, active or passive, either brought this on or increased it. A rough contact also awakened it, but a touch would not. Once started, the pain spread outwards from the spot first influenced, and soon was felt irregularly here and there throughout the side, but within half an hour, even if severe, it faded away. Sensibility was not extinct in the arm or the leg, and in these members every touch was pain. In the face and neck, and at parts of the trunk, the anæsthesia was complete, but deep rubbing or a blow would cause the same pain, and then the same radiation of it would occur. At the same time there were more or less constantly a feeling of formication, and of horrible burning, and a sense as of worms crawling under the skin. As in other cases of unilateral burning, with or without anæsthesia, there was a great increase from effort, as in the strain of defecation. In this man, as in a case which I now see frequently, there was also a sense of constriction around the waist, and in various parts about the limbs, like the common girdled feeling of myelitis and ataxia.

He walked pretty well with a cane, but put the foot down clumsily, and did not like to use the hand, owing to the pain it caused. He could open and shut the hand at will, and the force of the grip differed little on the right and left; but the effort to seize any minute object with the right hand resulted in curious awkward movements, ending at last in repeated and annoying failures.

When the hand was not in voluntary activity, the fingers were in constant motion. They opened and shut, and came together or spread apart laterally, and this if the eyes were opened or not. I regret that I did not ask if this motion ceased in sleep. A voluntary act substituted for these movements the strangely awkward efforts I have spoken of, which would without doubt, I think, be called choreal. Excitement greatly increased their peculiarities.

There was in this case another point of interest. If he willed a movement, as of the fingers, he could tell where the motion placed them, but if I bent the wrist and crossed the fingers he was absolutely unable to say where the parts were, or in what relation, but he walked or moved his hands as well with his eyes *closed* as with them open. This man had no heart trouble, and no syphilis. He worked as a teamster, or rather owned a number of drays. He had normal urine, and no disorder of the eyes; indeed, as far as I could learn, had no double vision at any date.

The numbness improved, but in July, 1872, he died suddenly, with a large clot in the right cerebrum, and was said by the surgeon, who made the examination, to have had evidence of a large old cavity, which occu-

pied much of the left corpus striatum, and this was all I could learn of this most interesting case.

CASE IV.—R. W., æt. 19. This girl previously suffered from loss of appetite, but although living in a damp, undrained house, was as to all her organs and functions in good health. In March, 1869, after an attack of sick stomach and headache, she went to bed at 6 P. M., and awaking at 9 P. M. was seized with hemiplegia of the left side and left face. For twenty-one days she could not move, and then the leg got better, and was well, though very easily tired when I first saw her. The arm also improved, but although it had every motion, she could raise Duchenne's dynamometer to 70° with the right, and only to 25° with the left grasp.

Sensation was lessened in the left hand, nine lines being at the index-finger tip the confusion limit. The left hand was cold and easily chilled. Under induction currents to the muscles, dry faradization to hand, hypodermic injections of strychnia, with tonics, the hand grew warm, the feeling improved, and the grasp-power rose to 50 (left) by June 9th.

During the time she was under my care, the arm and hand exhibited, during voluntary movement only, all the usual difficulties and irregularities seen in a case of well marked chorea. She dropped things, failed to direct her motions, and was plainly choreic, but only in the hand and arm, nor did these improve as her general strength grew better.

These cases may suffice as examples of post-paralytic chorea in adults. I have seen many others and some even more remarkable, but of which I have not notes. It is to be observed as regards all of them, that the chorea occurred in either right or left half-palsies, that it was worse in the region of complicated motions, the hand, and that in no case was it seen in connection with rigidity of the part, while its presence and long continuance seemed to be consistent with various degrees of regained power, from the least up to the most complete.

I might also have added to my cases a number of those singular forms of post-paralytic spasms in which the arm or the hand incessantly repeats certain regular and purposeless motions, which in some cases are unrestrainable, in others are seen to disappear during volitional acts which, in this case, may or may not show by their irregularities any trace of the spasms alluded to. I had one patient who, after a right hemiplegia, incessantly rubbed the right leg with the right hand, so as even to wear out the pantaloons. I know of another whose arm is alternately pronated and supinated, and one whose limb swings across the body only as he walks, at each step the fingers being firmly flexed. All of the post-paralytic cases are not quite so hopeless as those given above, but as a rule the chorea is likely long to outlast the return of normal power; yet as to this question of full power, I think it right to add that the return to a healthful standard of endurance is very rare, and that invariably prolonged exertion increases the choreal troubles for a time, as any lowering agency affecting the general health will do for a longer period.

The cases of complete recovery were always in very slight palsies.

CASE V.—In January, 1874, I saw a man, T. G., æt. 52, who, in April, 1873, with no premonition had left hemiplegia, and was insensible for an hour. He had a sense of numbness, but when I saw him the power and the feeling were normal. The inco-ordination of the hand was most striking, and so also, as is not rare in these cases, was the absence of tremor. He could not handle or pick up minute objects at all. There was no movement when the part was not volitionally exerted. Six months treatment by strychnia and induction currents, left him with scarce a trace of the old trouble.

I have remarked at the beginning of this paper upon the rule which I thought demonstrable, in accordance with which post-paralytic chorea is more surely found, the younger the subject of the paralysis. I think I can go further, and state that very few cases of hemiplegia in young children fail to leave them with more or less of the form of inco-ordination we call choreal. I suspect, also, that it is not to be seen in the slight brachial palsies, resulting from the true spinal palsy called infantile, but slight brachial remnants of infantile palsy are rare. I may possibly be wrong as to this point, but I have been used to diagnose at sight from the choreal movement during volition, the presence in a child of a cerebral palsy. This, at least, I am sure of, that very complete infantile palsy may occur, and pass away, leaving no choreal heritage, while as profound a loss of power from cerebral disease almost surely sets this future mark upon the muscular motions of the limb.

The post-paralytic chorea of man is troublesome enough, but that of childhood is more grave, because it makes it so hard to relieve deformities, and to treat with success the relics of the palsy, while, also, it interferes with education in very many ways.

If I had any hesitation as to naming the post-paralytic inco-ordination as choreal in the adult, I should not have a trace of doubt as to my clinical right so to call it in the child, and I suspect that when attention is fully given to this class of facts, almost every physician will be able to recall to mind cases of this interesting malady.

As might be expected, children born palsied are sure victims of choreoid disturbances. I have the belief that some of the forms of general and congenital chorea, with partial limb-weaknesses, or sometimes with general lack of power, are merely examples of the remoter consequences of intra-uterine cerebral palsies. If I had studied with more care the cases of these congenital choreas which have passed under my eye, I could, I suspect, have often obtained evidence of the former palsy, but while to look at a case with a special object has its logical dangers, it has also, for well balanced searchers, its plain advantages; and at the time when I saw the best of these cases I had not begun to know how much of interest lay in their study. They seemed then to me, as to all of us, hopeless, irremediable curiosities, utterly inexplicable, from which no man could learn anything of value.

I quote the following case from the note-books of my clinic at the

Infirmity for Nervous Diseases as illustrative of my meaning. It is, of course, open to infer that there may have been intra-uterine defects of neural nutrition, rather than a true palsy, and such may, indeed, have been the case.

CASE VI.—R. G., female, æt. 4, of light hair and complexion, and healthy appearance; is intelligent, but speaks with difficulty; no trace of facial palsy; is now always well, and has never been ill. From birth she has been excessively feeble in the trunk, and cannot sustain her head erect without aid. The right leg is very weak, the left better, and she can stand by a chair, but only with large aid from her arms and hands. The right arm is the more feeble, but both upper limbs are much more powerful than the lower, whilst among the muscle-groups in either arm some are much stronger than others. The hands are kept in slight flexion, but can be extended. There are no notable atrophies, and no lack of sensation. The notes of the electrical condition have unhappily been left out. While, with more or less effort this child could move every muscle, some of them could be but merely stirred, and were incompetent to effect a motion of the part. The whole body was more or less disturbed by choreal movements, which were mild though incessant during inactivity, but hopelessly wild and disqualifying during voluntary action: those of the hands being most remarkable.

I have spoken with caution of the origin of this case, and have quoted it chiefly to call attention to this class of possible causes of general chorea.

The following case is an excellent instance of chorea from paralysis at birth:—

CASE VII.—C. W., female, æt. 11, was delivered by forceps, and when born was in general convulsions. She bears to this day the mark of the forceps upon her left temple. The convulsions disappeared within a few hours, and left her with total palsy of the left side, and inability to take the breast. From this time her history is that of an early hemiplegia. In later years this palsy involves no atrophy, but in early life every paralysis, cerebral or spinal, may cause atrophic change, and even the most distinct cerebral palsy may bring about defects of nutrition and absolute shortening of limbs. In the present case the loss of power lessened by degrees, and when I saw her first she was then nine years old; the right leg and arm were a good deal shrunken, or, rather, were undeveloped, the right leg a half inch shorter than the left, and owing to relatively greater palsy of the extensors of the foot, the gastrocnemial mass was shortened from lack of opposition, and the heel drawn up. The power of the right (paralyzed) foot and hand was greater than that of the left members, and was unusual for a child of her age. Her leg was so awkward in its motions that falls were common. The hand and arm had all the peculiarities of the most perfectly typical case of chorea. The fingers were rarely still, and the arm was given to sudden and irregular activity. I cannot better describe the hand in action than to ask the reader to take as an example of its movements the last well-marked case of chorea which he may have seen. Although slow in intellectual development, the child was clever and quick, but inclined to write, sew, or make signs by preference with the left hand.

The treatment, which was unusually happy, extended over years, but as

yet it has but partially restored to the hand its needed dexterity, nor can I hope that this limb will ever be as nimble as its fellow.

I have seen a somewhat similar case, now *æt.* 17, in which there was a forceps delivery, convulsions, and *general* loss of power, with rapid restoration, good as to the left arm, but slow and incomplete as to the right arm and both legs. To this day the motions of the right arm, now as vigorous as need be, are distinctly choreal. The left arm is natural; both legs contracted; some of their muscles contracted, some were totally palsied, and, at the age of 15, she crept on her hands and knees. Dr. T. G. Morton, who saw this case with Dr. Wm. Hunt and myself, after consultation divided a number of tendons in the legs and feet, and, aided by apparatus, and after long treatment by massage and electricity, this very interesting patient walks erect, her moral and intellectual development keeping pace with the physical gain. The constant obstacle is the awkward choreal movements of the legs and the right arm, which at present constitute the real and most serious obstacle in the way of entire cure. I was struck in this case as in the last with the fact that for many years there was, with right hemiplegia, a more or less notable difficulty of speech, a difficulty not only in articulation, but in choice of words or in finding the needed word. It is now in both cases rather a trouble of articulation or of readiness in speech, than of memory of words.

CASE VIII. was a male, *æt.* 4; had convulsions from unknown cause which ended in left hemiplegia, slowly passing away in a few years, and left him, as far as power and endurance are concerned, absolutely well. Curiously enough, at the age of 16 years the right grip is less strong than the left, although he is right handed. The loss of capacity to execute with the left hand, any movement except the grossest, is most remarkable. He drops a cup or a tumbler, and fails again and again to pick up a pencil or a coin. The lack of power to direct motions is the most conspicuous I have ever seen, and is so increased by excitement or by failure that the hand then moves irregularly and spontaneously, which it never does under ordinary circumstances.

Very recently a lad was brought to me from near Pottsville, who it seems had convulsions and right hemiplegia at the age of six years. He recovered in a remarkable degree the power and endurance of both leg and arm. The leg, however, lost an inch in length, showing, as I have again and again remarked, the power of cerebral palsy in the child to affect growth. In this case there was always some difficulty as to language, but it was a trouble of articulation rather than aphasic; nor indeed have I ever seen a case of aphasia in the many well-marked right hemiplegias of children which I have met with. The age at which aphasia troubles are first to be seen would be worth knowing. He had with no losses of sensation a choreal disorder of leg and arm which baffled all efforts to overcome, so that, despite orthopædic instruments which were multiplied endlessly, he was constantly falling, while his hand was almost useless. I

had him subjected to a long and elaborate gymnastic training, and as he was fond of music he was taught the piano and violin. In some years of such teaching he came at last to have a far larger and more accurate command of the uncertain limb. He had been drugged a good deal before I saw him—and here I may as well say once for all, that in these cases, unless there is a failure of general health, the usual anti-choreal drugs, arsenic, zinc, etc., are worse than useless.

It were quite needless to multiply cases of this kind, as I might readily do. Enough has been said to illustrate the propositions with which I started. I might well have added a number of interesting cases of post-paralytic motorial disorders, but they would not have come under the heading of choreal, and I have for this reason refrained. I hope, however, before long to present in fuller form a clinical study of all the consequences, nutritive, sensory, and motor, of the hemi-paralyses, both of the adult and the child.

ART. III.—*Trembling and Loss of Co-ordinating Motor Power, as Symptoms of Nervous Disease.* By ALLAN McLANE HAMILTON, M.D., of New York.

THESE two symptoms, trembling and loss of co-ordinating power, characterize some of the most serious disorders which the cerebro-spinal nervous system is liable to, and a clear idea of their various forms as they sometimes occur, is most necessary to establish a diagnosis, and arrive at conclusions which will determine a rational form of treatment. They appear in many diseases which closely simulate each other; when the central lesions are widely different, and perhaps while one is curable, the other will never yield to the most persistent treatment.

Any condition interfering with the continuous discharge of nervous stimulation, will be characterized by tremor in remote parts of the body, or the muscle supplied by nerves taking their origin from that part of the nervous axis where the trouble exists. When this trembling occurs, the motor nerve roots are affected, while in all cases sensation preserves its integrity. The will may, or not, have power to control these motions, and in some diseases the tremors are increased instead of diminished, when an effort is made by the individual to control them.

Tremor may exist as evidence of central nervous disturbance of various kinds. It may result as a consequence of hyperæmia of the nerve centres or of molecular, chemical, or other changes such as follow the saturation of the system by alcohol, mercury, or lead. This latter form is purely a functional derangement, and the exciting cause once removed,

the prognosis is usually favourable, except when the toxic agent is mercurial. It may result as a sequence of atrophy of nerve roots or the terminal twigs of nerves themselves, as in the case of progressive muscular atrophy. It may be the result of induration or deposit of fat, and then the prognosis is most unfavourable.

Tremor has been divided by Swieten, Gubler, and other neuro-physiologists into two varieties. These are, trembling which is present when the body is in a state of repose, and this is due to an irritation of the nerve centres, and has been called the *tremor coactus*. Another form is manifested exclusively during the performance of voluntary acts, and is dependent upon want of stimulation and insufficiency of nervous fluid. This is a species of paralytic tremor, and may be called the tremor of debility, or *tremor paralysie*.

Gubler recognizes a form which consists of a succession of alternate contractions and relaxations of the muscles in play, which occur in spite of the will, and seem continuously excited by an internal stimulation. He calls this *muscular ataxy*.

It is the opinion of Eulenburg that the spinal cord is concerned in the production of tremor, and that it must be involved to produce this symptom. He substantiates this assertion by the statement that the facial muscles are never involved. I have a case under my charge at present, however, of well-marked cerebral sclerosis where tremor of the muscles of the whole left side of the face is evident. There is no indication of spinal sclerosis.

The localization, rapidity, and quality of the tremors, and the influence of the will must make up our diagnosis.

Tremors may be confined to either the lateral, upper, or lower halves of the body, or single muscles, or organs may be alone affected. The upper half of the body is most often the part attacked, and the arms and head particularly so.

The diseases which are characterized by this symptom may be enumerated as—

Functional derangements.	{	Hyperæmia of the cord and medulla.
		Alcoholism.
		Metallic Poisoning.
Organic diseases.	{	Multiple sclerosis (or " <i>sclerose en plaques</i> " of the French).
		Paralysis agitans.
		Chorea.
		General paralysis.
	{	Progressive muscular atrophy.

Perhaps the most important disease to be considered is paralysis agitans. The tremor here begins as the first symptom, usually in persons of advanced life, but sometimes in young children.

The term paralysis agitans for the species of disease which young

children exhibit is not altogether appropriate, but Hammond so defines it, however. The disease is so light, so inconstant, and so amenable to treatment that in this respect it differs from true paralysis agitans. In this form there will be found an atrophic condition of the nerve cells, and in the latter usually no constant pathological change but only a hyperæmia of the nervous substance.

The trembling of paralysis agitans occurs at all times with voluntary muscular movements, and also when the body is in a state of tranquillity; and is not entirely affected by the will except that it may occasionally be moderated. There is never loss of muscular power at any time, as may be ascertained by testing with the dynamometer; it differs in this respect from multiple sclerosis where paresis is an early and permanent symptom. The tremor of paralysis agitans sometimes involves one side, or the upper half of the body. The oscillations are rapid and regular, and Charcot uses another qualification expressed by the word "*serres*." The tremor of paralysis agitans is unassociated with sensory or intellectual impairment. The tremor is different from that of sclerosis, for in the latter there is what may be called a tremor of inco-ordination. The trembling of paralysis agitans diminishes after making an effort.

The next most serious form of trembling is that associated with sclerosis of the upper part of the cord, and the brain. With sclerosis, the trembling will usually be found in the upper half of the body. The tremors occur in opposition to the will, and increase as this power is used. All of the simple acts of every-day life are performed with difficulty. I have noticed in patients who attempted to carry drinking vessels or spoons to their mouths an inability to do so, and when the act was attempted the glass would be carried upwards, vibrating and oscillating in a lateral manner, and I have observed in a great number of cases that the movements of the hands of those persons suffering from sclerosis is usually a modified alternate pronation and supination, while the movement in paralysis agitans seems to be alternate flexion and extension. The tremor of sclerosis is nearly always preceded by paralysis, contraction of the limbs, disturbance of speech, and other symptoms occurring almost at the same time. When the head is affected Charcot and Bourneville believe the disease to be always sclerosis, and never paralysis agitans. I have seen a case of this kind in which, with the trembling, the head was drawn to the left side and inclined forwards, the right sterno-cleido-mastoid having lost all power. The tremor in this patient was aggravated when the will was exercised with the aim of diminishing it. General paralysis is characterized by trembling and quivering of the tongue, lips, and muscles of expression. Where the tongue is protruded it trembles visibly and there is difficulty in forming words. The diagnosis of this is very easy, for a rapid succession of other symptoms, and the concurrence of inequality of the pupils, ptosis, and defect in locomotion soon clears up the speculations of the physician.

Tremors in simple muscles or groups of muscles are often found as symptoms of nervous diseases. The muscles of the tongue will be involved sometimes, giving that organ an undulating movement; this is characteristic of sclerosis. In progressive muscular atrophy occasional fibrillary tremors in the peripheral muscles without shaking of the limbs are to be observed. Muscular contractions here are weakest with the occurrence of the tremor. Continuous trembling of the eyelid may be suggestive of commencing sclerosis or structural changes.

Tremor is occasionally a symptom of chorea, but the age of the patient, and the convulsive character of the jerks, which are uneven on both sides of the body, will clear up the diagnosis.

Alcoholism nearly always has a species of trembling for one of its symptoms. The trembling has a very regular vibration, is much worse in the morning, and is associated with more or less loss of co-ordinating power. Mercurial tremor, which is rare, begins in the superior extremities, voluntary movements are exaggerated, and the contractions of the flexors are strongest.

Lead trembling, which is more rare still, occurs at night, and is associated with paralysis of the extensors, and is usually preceded by colic.

Functional trembling from other causes may be diagnosed by the existence of concurrent symptoms, and from the disappearance of trembling after the administration of remedies.

Numerous experimenters have endeavoured to arrive at some way of classifying tremors, and Dr. Fernet of Paris, who has given his results in a thesis reprinted in the *Archives Générales* of November 1872, has found that by means of the myograph a muscular contraction in a state of health would make a continuous straight line on the index of the instrument, or that artificial contractions induced at the rate of 32 per second would place the muscle in a physiological state of tetanus, when the same effect would be produced. When the number of these contractions amounted to but 27, a series of oscillations occurred which imperfectly coalesced. With 10 contractions a second, the coalescence was exceedingly imperfect. The result of these experiments was obtained by artificial means. In disease a number of clinical cases demonstrated that the various tremors occurring in the several diseases I have enumerated were characterized by different tracings.

In multiple sclerosis a slight muscular contraction yields a line with regular oscillations of slight extent and taking place at the rate of 3 per second. In mercurial tremor the jerks are longer and the oscillations are not as marked. Various other diseases give different oscillations and tracings.

Fernet's conclusions are that—

The number of jerks is less in proportion as the oscillations in the line given by the myograph are more extensive. The number of jerks in a

given time in the case of any one patient suffering from tremor, either do not vary at all, or only very slightly, according to the state of rest or motion.

It is the general opinion of neuro-physiologists that the power of co-ordination is *principally* centered in the cerebellum, but there are other organs and conductors which must be normal to insure the perfection of muscular movements. The conductors which carry nervous impressions to the mind for action, the parts of sensation, the organs of special sense and their nerves of communication with the muscles must preserve their integrity, to be in harmonious relation to the gray matter of the cord, and the cerebellum which furnishes in turn a quality known as the muscular sense. For instance, we find, that, when the eyes of some persons afflicted by certain nervous diseases are shut, the muscles concerned in the preservation of the equilibrium of the body will be found to have lost their power and the patient topple over unless supported. Any sensation or impulse imperfectly sent to, or received by, the nervous centres may be the cause of improper co-ordination.

Brown-Séquard, however, has proved by careful experiments that the spinal cord itself may be also the seat of co-ordination; that the irritation of certain parts of the lumbar portion will be followed by inco-ordinate movements of progression when the animal begins to walk, and that these inco-ordinate movements are brought about by the failure of concerted action on the part of muscles receiving their supply from below the irritated part.

The existence of inco-ordinate movements when that part of the intellectual apparatus devoted to perception and will is so perfect as to receive impressions, and still unable to exert sufficient control over the peculiar want of muscular harmony, suggests somewhat strongly that the trouble is to be found in some region which is a sensor, and not a distinct intellectual centre.

The phenomena of reflex action where sensations may be received, and motor impulses transmitted, such as follow decapitation of the animal, show us that it is not necessary for the cerebrum or cerebellum to be in working with the other parts of the nervous apparatus.

Most of the movements that are affected or changed, may be said to be automatic, and the greater number of the muscles take their nerve stimulus from the cord itself; even the tongue is animated by nerves starting from the upper part of the cord. I doubt, therefore, if there has been any case of lost co-ordinating motor power, where there have not been lesions of the cord and usually of the gray matter, or posterior columns.

The relation of the organs of special sense to properly co-ordinated movements is patent to every one. Here again I am of the opinion there is some interruption in the transmission of the nervous force which is guided by impressions received by these senses, either in a delay of action

on the part of the cerebellum, or an interference of the functions of the anterior columns, so that properly guided cerebral mandates are not sent to, or obeyed by the motor nerves.

The cerebellum of course plays an important part in the harmonization of all movements, and this Dalton and other eminent and experienced observers have conclusively shown, but Lockhart Clarke, Hammond, and various neuro-pathologists show this to be but a temporary suspension of co-ordination, and some writers go so far as to state that this is not a loss of co-ordination at all, but simply a species of vertigo.

Van der Kolk considers that the removal of the cerebellum has the effect of violently irritating a layer of gray matter containing multipolar cells, which lie between the motor fibres passing from the corpora pyramidalia through the pons to the crura cerebri, and the transverse fibres of the pons, where they decussate; there irritation is reflected by the transverse fibres upon the corpora pyramidalia, and inco-ordinate movements result. Van der Kolk has never seen a loss of harmony in muscular movements with diseases of the cerebellum, when the irritation of that organ was excessive.

In every individual there are a number of movements which are automatic; even the act of walking may be performed when the will and other intellectual qualities are dormant; and the most complex acts, such as the playing of musical instruments and the use of tools, may be counted in this list.

The human being at a very early period of his existence begins to walk and perform the muscular movements of every-day life without any mental guidance in the beginning; afterwards the mind becomes trained and developed and the number of these movements becomes more complicated as intelligence enters into the work. A great part of the ability to do these is accomplished by instruction. All movements become automatic to a great degree as the individual advances in years. The incapacity of the nerve centres to supply or receive the normal sensations, where induration or degeneration occurs, destroys their automatism, and I am convinced that loss of co-ordinating power depends to a great degree upon the disturbance of the automatic state.

The different kinds of inco-ordination are shown: *a.* In speech. *b.* In the movements of the upper limbs. *c.* In the movements of the lower limbs. *d.* In the loss of location.

When speech is affected, so that the patient finds it impossible to frame perfectly formed words, we may infer that the disease affects the upper part of the cord. The speech is slow, and there is a pause between the articulation of each syllable; the consonants *l*, *p*, and *g* are pronounced with difficulty, and sometimes the other consonants are substituted. The muscles of the tongue are uneven in their contraction; and the person speaks, to use a homely simile, very much as if he held a hot potato in

his mouth. The words are jerky, some of them pronounced plainly, and others with great difficulty and indistinctness. This symptom must not be confused with the condition characterized by the substitution of wrong words, or simple paralysis of the tongue, nor confounded with the disturbance of speech which is observed as a symptom of paralysis agitans where the words are only pronounced slowly.

We find that when the lesion is in the upper part of the cord, there are certain defects in co-ordination shown most clearly in the upper extremities. The seizure of objects is attended with considerable difficulty. It is impossible to perfectly perform the act attempted. The patient in carrying his fork to his mouth will usually run its tines against his cheek or even miss the head altogether; with this there will be loss of power, and ultimately contraction of the limbs.

One variety of loss of co-ordination rarely dependent upon any serious pathological change, is seen in the disease known as writer's cramp. When the patient attempts to write, the first part of the word or first words of the sentence will be written properly, but suddenly the pen will fly off, and the more the will is exercised, the more the symptom will be exaggerated. The patient may educate the other hand to the work, but the same state of affairs usually follows in a short time. There is rarely paresis, and the trouble is purely a functional one. Russell Reynolds believes it to be what he calls "secondary automatism." It is indeed a hyper-education and use of the muscles used in one kind of act. Other movements may be performed requiring the utmost delicacy of manipulation, with ease. The disease is the result of a depressed nerve tone.

When we consider the inco-ordinate movements of the lower extremities, we are indeed puzzled by their complexity. The two forms of failure to co-ordinate in locomotion which are important, are paralysis agitans and locomotor ataxia. The history of the case and the consideration of the combined symptoms will enable us to arrive at some clear idea of the disease.

The progressive movement in paralysis agitans is a species of *festination*. The patient inclines his body forwards and seems impelled to run, there being no resemblance to locomotor ataxia of the gait itself.

The gait of locomotor ataxia is characterized by the peculiar jerky extension of the foot. The force of muscular movements is increased to such an extent that the feet are thrown out and the heels come down with a thump. The muscles of the thigh participate in this general failure, and I have found in several cases that the adductors of the thigh have undergone a marked impairment of power.

There are defects of co-ordination which are interesting in this disease, and one is the difficulty of going down inclined planes. In turning about during the walk the patient will generally find it impossible to stand. It is almost useless for him to attempt to stand on one foot. When sclerosis

has its seat in the lateral column, Hammond describes the walk as being associated with a lateral swing of the body, and the patient glides always in a serpentine manner, the extensor muscles not having power to lift the feet from the ground.

The inco-ordination of muscular movement in alcoholism is always associated with delusions. There is also a species of loss of co-ordination which occurs with the early stages of general paralysis; the acts of sewing or writing are impossible.

Loss of co-ordination may be found by several tests to which the patient may be subjected, but as every one is familiar with these, I will only allude to them in a general way. One which Wunderlich and Romberg considered conclusive is the inability to stand with the eyes shut. The patient brings his heels together, and shuts his eyes, when he will immediately topple over and fall. This may be detected when sclerosis of the posterior column of the cord exists to a very slight degree, by a swaying to and fro of the body.

The location of places is lost when there is sclerosis, and it will be impossible when the senses do not guide the patient for him to exactly find any small spot with the tip of his finger when his eyes are closed; for instance the tip of his nose.

If his legs are changed very rapidly from one place to another, he will find it almost impossible to locate their final position when they are at rest. When the mind is detracted from the body, as occurs when the patient is reading, he will, when unexpectedly asked, be unable to tell where his feet are. For instance a patient now under my charge, when lying on the sofa reading with his feet higher than his head, will begin to make some change supposing them to be upon the floor or on a level with his body.

These symptoms occurring with others will always enable us to approximately arrive at a diagnosis. Sclerosis, whether diffused or spinal, is symptomatized notably by marked inco-ordination and trembling. Paralysis agitans comes next, and we may direct our attention to these primarily in nearly every case.

ART. IV.—*Historical and Analogical Record of the Siamese Twins.*

By ROBERT P. HARRIS, M.D., of Philadelphia. (With a wood-cut.)

Nativity, etc.—Eng and Chang were of Siamo-Chinese blood, as are many of the three millions of inhabitants of Siam. Their father was born in China, and spoke the Tai-cheu dialect, went into Siam, and married a native woman whose father was Chinese, and mother Siamese, thus causing the twins to be three-quarters Chinese blood, and accounting for their dark

colour and Chinese appearance; the pure Siamese being a bright gamboge-yellow like colour. They were born at Mâ Klaung (*Meklong*), a small fishing village, some sixty miles southwest of Bangkok, the capital. Their parents were well built, of medium Chinese height, and belonged to the poor class of *boat inhabitants*, living in small floating houses, moored along the banks of rivers; of whom there are great numbers in Siam. The mother of the so-called *Siamese* twins was about 35 years old at the time of their birth, and of a complexion resembling that of the Chinese rather than Siamese. She is said to have brought forth four female children prior to the "twins," and to have had a family of fourteen in all; ten of them being twin births. No special inconvenience was experienced during her period of gestation, and she declared upon several occasions that Eng and Chang were delivered reversed, the feet of one, and head of the other being together, and that there was no marked difficulty in their extrusion, as they were quite small. In corroboration of this statement of the presentation of the twins, it has been repeatedly affirmed by them that in early boyhood, and up to the age of ten or twelve years, they very frequently assumed a reverse position, with the head of one towards the legs of the other, when at play upon the floor or ground.

It will be noticed that we have reversed the usual order of the names of the twins, going back to that adopted in Europe many years ago, when Eng was given the precedence, as the larger of the two, and standing upon the right. We see no reason why Chang, simply upon alphabetical principles, should be most prominently named, when, by so doing, it only leads to error and confusion in describing them in a distinctive sense, as to physical condition, peculiarities, etc. We have, therefore, resumed the order under which there can be no possibility of mistake. *Eng* (meaning *right*), being the larger, taller, stronger, more healthy, least deformed, and placed upon the right, is named first, as we conceive for these reasons he very naturally should be. In the *Ritta-Christina*, Ritta was on the right, and for this reason was named first.

Eng and Chang were quite feeble at birth, and for the first six months of their infancy. Chang was then the larger and became the more healthy boy of the two, Eng being rather delicate for some years; after which he in turn grew to be the more robust, and so continued throughout life. The exact date of their birth cannot be ascertained, although when exhibited in Philadelphia from Oct. 6 to 10, 1829, their exhibitor gave it as May, 1811. Their parents in after years, when questioned by one who spoke their language, were not so definite, and said that it was either in the latter part of 1811, or beginning of 1812. They were, therefore, as near as can be ascertained, about 62 years old at the time of their death (Jan. 17, 1874), an age very far in advance of any other diploteratological specimen upon record. It has also been stated that at the time of their birth it was with some difficulty that their lives were saved from destruction by order

of the king, who held a very prevalent superstition, that such freaks of nature were portentous of evil to the reigning power, numerous evidences of which may be found in the histories of monsters.

Discovery and Removal from Siam.—Their existence was first revealed to the civilized world by Mr. Robert Hunter, a British merchant residing at Bangkok, who met with them when boys of twelve or thirteen years of age, in the year 1824, as they were boating, stripped to the waist, on the river Menam, not far from the capital, where their parents then resided; being attracted toward them by their strange appearance in the distance at night. He made various unsuccessful attempts to gain permission to take them to England; and finally prevailed upon their parents and King Chowpahyai to let them go. They set sail on April 1, 1829, in the ship *Sachem*, Captain Coffin, via Boston, which port they reached in August. Here they were carefully examined by the late Prof. John C. Warren, M.D., of Harvard College, the first physician to make an exploration of their bond of union, and an investigation into their special mental and physical relations with each other. The results of his observations were sent in letters to several prominent editors of medical journals in this country¹ and in England. At that time, Eng was about 5 ft. 2 inches high,² and Chang half an inch shorter. They were believed to be eighteen years old; wore very long, black queues, wound thrice around the tops of their heads coil within coil; and presented the characteristic features of the Chinese race, being, as before stated, but quarter-blood Siamese.

Migrations, etc.—Having remained eight weeks in the United States, divided between Boston, New York, and Philadelphia, they set sail directly for England from New York, October 16, and reached London on the 20th of November, 1829. After a tour of exhibition, and being disappointed with the cold damp climate of England, they returned in a few years to this country, which from that time became the home of their adoption; and finally assuming the family name of Bunker, settled upon farms in North Carolina, where they resided at the time of their death.

Not being permitted to visit France, upon their first European trip, although much effort was made in Paris to get them admitted, especially on the part of Coste, the embryologist, they made a second attempt in 1835, which proving successful, we find due notice of their appearance and peculiarities, in several of the Parisian medical periodicals of 1835-'36. We presume the cause of opposition to their being exhibited, was that which prevailed against the *Ritta-Christina*, in Paris, in 1829, viz., a

¹ See Am. Journ. Med. Sci. for Nov. 1829, p. 253, where will also be found an excellent representation of the twins.

² Eng finally reached a height of 5 ft. 5 in., and was $1\frac{7}{8}$ in. taller than Chang. This difference was almost entirely between the band and the tops of their heads. Chang, if straight, would have been about 5 ft. 4 in. He became more crooked after his attack of paralysis, in 1869.

popular impression that a sight of them might cause some of the French women to breed abnormal children of a similar type; an opinion that is by no means confined to France, nor excluded by the medical profession, as the reports of cases of monsters in medical journals will from time to time evince.

After an interval of 33 years, the twins, in 1869, made a third trip to Europe, which was much heralded at the time, and becomes now a matter of historical interest, because it was stated that they went mainly with a view to consult leading Surgeons of Great Britain and France, as to the propriety and feasibility of an operation for separation. It is true that with this apparent intent they did present themselves as proposed; and that they were examined by Sir Henry Thompson, Sir William Fergusson, Prof. Syme, Sir James Y. Simpson, Prof. Nélaton, and others: but the real cause of this journey was to retrieve their lost fortunes, using these examinations as a scheme whereby to secure a free notice by the press and a larger attendance on the part of the curious at their exhibitions, a *ruse* often practised by them in former years under direction of their agent.

We will find by reference to the leading medical journals of 1829, '30, '31, '36, and 1869, the most elaborate articles that have appeared in reference to their peculiar manner of union, and the cases which most closely resembled it. It is questionable whether the Siamese Twins ever fully realized the inconveniences of their attachment, or *sincerely* desired to be separated. When the late distinguished Naval Surgeon, Thomas Harris, examined them at the Masonic Hall in Philadelphia, in 1829, and hinted at the propriety of an operation for separation, Chang, who from early childhood was never remarkable for his amiability, tried to kick him, as a mark of disapprobation of the proposal. It is true that many years later, under the feeling of antagonistic hatred engendered by a quarrel, they did desire their family physician to cut them apart; but whenever questioned in calm moments, declined the office of the Surgeon. How much may have been due to fear of suffering, or of a possibly fatal result, we cannot tell; but the excuses framed by them appear to have been largely based upon a want of appreciation of any happiness to be obtained by an independent existence, believing themselves to be quite as much in the enjoyment of it as those with whom they came daily in contact. A part of their objection may have also arisen from their notoriety as a curiosity giving them a certain living, in the event of being by any means reduced to poverty; and an antipathy to parting with their world-wide fame, from a species of pride, which, although unaccountable, nevertheless prevails to some degree with the congenitally deformed. Had they been successfully separated in adult life, at their own request, we should have seen all their individual physical defects very prominently brought to notice.

Individual Physical Defects.—From somewhat early life Eng was the

larger, taller, and stronger of the two ; but both were unsymmetrical in development. Chang was noticed as long ago as 1830, to have a very marked right lateral curvature of the spine, bending his chest over to the left ; and this in later years was accompanied with an increased obliquity in the line of elevation of the shoulders, the left being much depressed below the right. In an independent state, he would have walked obliquely to the left, with his left foot turned outward and right inward, his head bent over to the left, and face directed to that side ; and it is exceedingly doubtful whether he could ever have recovered from the effects of early necessity, and the abnormal development of his joints and muscles, so as to enable him to walk directly forward.

In a reverse direction, the same remarks will hold good as to the walking of Eng, who, although much more erect, would have had the same locomotive defects to contend with. The right arm of Eng, and left of Chang were better developed than their opposites, and the left shoulder of Eng, and right of Chang, much the wider, from the spine, to the end of the acromion process of the scapula.

The necessity of always looking obliquely forward, affected the sight of their outer eyes from quite an early period (noticed by St. Hilaire, in 1836) ; probably from childhood ; and this became so marked late in life, that with these eyes alone, they could scarcely distinguish any object. Chang was rather deaf in both ears, but the hearing of the brothers was most defective in the opposing ones. The outer legs were stronger and better developed than the inner ones, as the latter had much less freedom in walking. All of these defects were the result of a relative position assumed in childhood, and maintained throughout life. This also had the effect of making the opposing side of their chests *absolutely* flat ; which was compensated for by a greater degree of convexity than normal upon their free sides. It can readily be seen, that in a separated state each would have probably been under the necessity of learning to walk ; and would have presented a singular gait and figure, as compared with normal subjects.

Theories of Union.—Considered in a teratological sense, Eng and Chang belonged to the genus Omphalopagus (ομφαλος, the navel, and παγω, I fasten) ; and to the variety, Ziphodidymus, (ξίφος, a sword, and διδυμος, a twin) ; according to the classification of Dr. George J. Fisher, of Sing Sing, New York. There are many varieties of the omphalopagus genus, the most frequently to be met with of the homologous duplex twins reported in medical periodicals. They are rarely born alive, and when so, seldom survive more than a few hours or days. In these *ventre-à-ventre* unions, the connecting cartilages may be seated at the upper portion of a narrow isthmus, containing only the umbilical vessels, some interlacing fibres from the two diaphragms, and connective tissue ; or the bond of union may involve the thoracic and abdominal cavities, so as to make them common

to each, as low as the umbilicus, or it may be lower; within which will be found two or four lungs, two hearts or a double one, a single or double liver, connecting stomachs, one or two spleens, two or four kidneys, one or two sets of small intestines, the single one ending in a double *caput coli*, from which arise two large intestines, one for each foetus, etc.

We may consider it fortunate that these extensive vital inter-communications are much the most common; and that those of a type to render an operation for separation, a subject for question, so rare that but one or two are reported in a century. During the last two hundred years but three cases are known to have been met with, of a class to render an operation at all possible, without a rapidly fatal termination; the whole of the remainder having such intimate connections, that the knife or ligature were not for a moment to be thought of. Even in the cases where no important vessels or viscera traverse the band, there is a considerable risk of a fatal result from inflammation of the incised or ligated parts, extending into the veins or peritoneum.

The cause of the formation of duplex twins must of necessity be largely hypothetical, and for this reason, very dissimilar views have been and are held by embryologists, as to the primitive condition of the ovum or ova producing them. The following are the theories in dispute.

1. That there are two distinct embryos, or germinal traces in one ovum, which become united in the course of development, and that these are parallel in the omphalopagi, and become one at the centre of contact.

2. That there is but one germ, which becomes double by a process of division.

3. That the ovum is abnormally compound from the beginning, and the organs and parts composing the double monster are at once produced from the germ, without either separation or coalition of parts, other than belong to the natural process of development.

Each one of these theories has had its strong advocates; but the first is that now generally held by teratologists, especially as regards homologous duplex twins. We are not of those who believe fully in the general application of this law to *all* forms of diploteratological cases, for some of them are much more readily explainable on the basis of an originally abnormal germ. If the *trace* which produces an inherited redundancy of parts, as where six well formed fingers and toes are obtained by the parental impress, may be rated abnormal to the extent of the redundancy, why may not a greater degree of the same condition in the ovum account for many of the varieties of monsters by redundance, as provided for in the third theory?

It is well known that a duplex germinal trace has been observed in a single-yolked goose egg; and that double-yolked hen eggs have been repeatedly experimented upon by incubation without producing duplex

birds. It is a very satisfactory theory that the union of two parallel *traces* will produce such examples as the Siamese, Hungarian, Hindoo, and Carolina twins; that convergence of one or other extremity of the germs will by union account for many other forms; and that numerous sub-varieties result from irregularities of approach; but beyond and above all these are the cases which cannot be satisfactorily explained, without making an exception in favour of the theory of abnormally compound germs.

Dr. Fisher¹ says, "that the origin of *all* double monsters is *now known* to result from the development of two embryos, on the vitelline membrane of a single ovum, and *all their forms* to arise from the relative position and proximity or remoteness of the primitive germinal traces." To make this theory of universal application, we must account, in some instances, for the almost total disappearance of one twin germ, leaving but a distal fragment engrafted upon the otherwise normal body of the other, and in almost all instances attached to a corresponding structure. Such cases are more readily accounted for, upon the theory of an originally abnormal germ, than that of union by approach.

M. Coste,² the celebrated embryologist, examined the Siamese twins on the occasion of their first visit to France, in 1836, and in a note to the Académie des Sciences, expressed the opinion that they must have become united in the latter days of the first month, and when consequently they were not yet two lines in length. *He believed that their viscera were independent*, and that an operation of severance would probably have a favourable termination.

M. Le Sauvage,³ of Caen, France, who claims to have been the first to elucidate the primary condition of the formation of double or diplogamous monsters, says: "I have demonstrated that no junction can be established, except where two germs have been developed in a single ovule, and that then the two embryos must be contained in a common chorion; that they are constantly of the same sex; and that their coalescence is determined by the previous union of the two umbilical cords, the umbilicus always becoming, as it were, a point of departure for the adhesion." He calculates the time of the adherence of the Siamese brothers, as from the 15th to 20th day of intra-uterine life. From the tolerance of torsion in the band in early childhood, whilst the cartilages were soft, he formed an opinion that the connection was mainly areolar tissue; that as their development was normal, their umbilical vessels must have had a regular direction and growth to accomplish it: that "at the moment of union of the two embryos, the two intestinal masses in a rudimentary state were still contained in the membranes, and the regular direction of the umbilical

¹ Trans. N. Y. State Med. Soc., 1868, page 279.

² Journ. Hebdomadaire, 1836, vol. i., page 55.

³ Archives Générales de Médecine, 1837, vol. ii.; 2d Series, page 71.

vessels should lead us to think that they had been especially transmitted into each abdomen, which excludes all idea of communication between the intestines."

Diagnostic Examinations of the Bond of Union.—In view of the post-mortem revelations, this portion of our historical record becomes of peculiar interest, as it is natural for us to desire to know how nearly correct were the physical explorations made during life, in determining the anatomy of the band.

Prof. John C. Warren,¹ previously quoted, says of it: The upper part is hard, and composed of the ensiform cartilages, which appear to meet at an angle, and to be connected by a ligament, so as to form a joint. The breadth of the cartilage is an inch and a half, and thickness about an eighth of an inch. This joint appears to open and shut according to the position of the twins. "There is no doubt a network of bloodvessels, lymphatics, and some minute nerves passing from one to the other" . . . "Another question which has presented itself in relation to them, is whether it would be possible to separate them from each other with safety. There seems to me nothing in the connecting medium which would render such an operation necessarily fatal. *It is not impossible that the peritoneum is continuous from the abdomen of one to that of the other.* The division of this membrane would involve some danger, though not very considerable."

The late Prof. Valentine Mott, of New York, and Dr. Thomas Harris, U. S. N., of Philadelphia, examined the twins subsequently in their respective cities, and privately expressed a somewhat similar opinion.

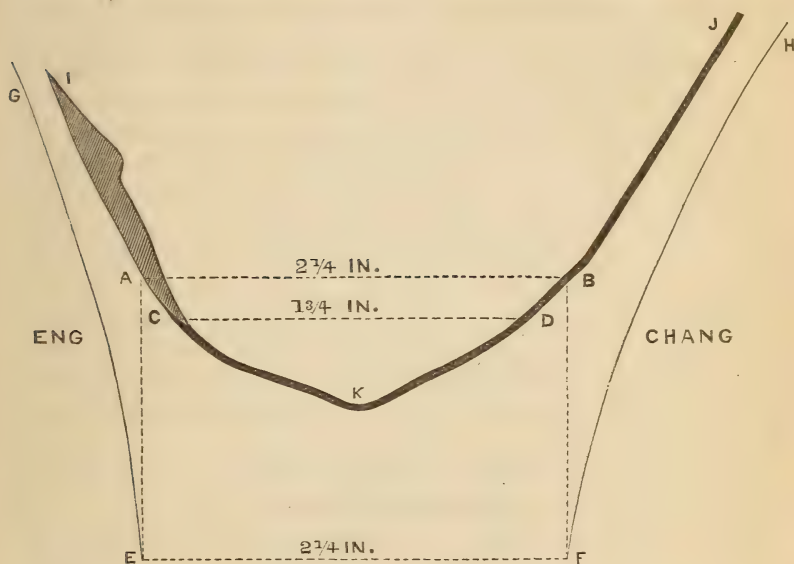
Sir. Astley Cooper examined them in London, in 1830, a few months after Dr. Warren, but does not appear to have been at all searching in his investigation, as he said that the band was composed of the ensiform cartilages, skin, and areolar tissue. He evidently was not at all satisfied as to its true nature, for he was not willing to say that he would be ready to operate if called upon; escaping from the inquiry, by turning the matter of *attachment* into a pleasing joke.

George Buckley Bolton,² M.R.C.S., presented (April 1st, 1830) a very elaborate report to the Royal Society of London, in which he says: "Under the cartilages, while they stand in their ordinary posture, are *large hernial sacs opening into each abdomen*, and into which on coughing, congenital herniæ are forced; probably in each boy formed by a portion of the transverse arch of the colon; generally, however, and under ordinary circumstances these herniæ are not apparent. Whether there is a communication between the two abdominal cavities, or a distinct peritoneal sac belonging to each hernia, is by no means obvious." . . . "When these her-

¹ Amer. Journ. Med. Sciences, Nov. 1829, page 253. .

² Philos. Trans. 1830, page 177.

niæ protrude, their respective contents are pushed forward *as far as the middle of the band.*" Mr. Bolton took several careful measurements of the band, with the twins standing face to face, as they are now represented in the cast, in the Mütter Museum of the College of Physicians, of Philadelphia, and gave its dimensions as follows: length at top $1\frac{3}{4}$ inches, at bottom not quite 3 inches, vertical depth $3\frac{1}{4}$ inches, and thickness $1\frac{5}{8}$ inches.



Very great discrepancies exist in the measurements taken at various periods by different observers; and yet there is every evidence to show that traction did not elongate the band, and that if it grew at all, between 1829 and 1874, it was not more than a quarter of an inch. Prof. Warren made the measurement at the top of the band in 1829 *two inches*. We make it now *two and a quarter*. There is a difficulty in exactly defining the points at the top of the band from which the measurements should be taken. Eng on his side presents a thick welt of skin at the sterno-xiphoid angle (see Fig.); and on Chang's there is little if anything to mark the point; but placed face to face there is a well defined angle on what is usually the anterior side of the band, where it leaves the thorax, and especially marked on the side belonging to Eng. The measurement here is $2\frac{1}{4}$ inches. If we carry up a vertical line on either side, we shall get the points required upon the top of the band, as here marked out. I K J, represents the curve of the top of the band, viewed laterally. E F, is the anterior measure where the points are well defined. A B, is our line of measurement; C D, we presume to be that of Bolton. G E, and H, F, represent the lines of thoracic curve from above downward, that of Chang being the most convex.

Sir James Y. Simpson, in 1869, gave the top measurement of the band as $4\frac{1}{2}$ inches, which he must have obtained by following the curve, as the direct distance from sternum to sternum does not attain this measure, until we reach a point $3\frac{7}{8}$ inches above the centre of the band. As he also makes the vertical measure $3\frac{1}{2}$, and circumference but $7\frac{1}{2}$, thus allowing for a thickness of only one-quarter of an inch, we must infer that his measurements were very imperfectly made. A vertical section of the band, represents an irregular oval, with its large extremity upward and obliquely forward, and with the greater convexity on the anterior side. The diameter from above downward as taken from the cast, is the same as that given by Bolton, *i. e.*, $3\frac{1}{4}$ inches. The transverse is 2 inches, and circumference $8\frac{5}{8}$. A horizontal section of the thoraces at the point of union, resembles the figure of two playing-card hearts, one larger than the other, with their apices elongated and close together, and contiguous sides flattened to a straight line, so as to bring their bases much more nearly in a side by side position.

Mr. Mayo,¹ Professor of Anatomy, King's College, London, (1831) stated, as the result of his investigations, that, "when either of the brothers coughed, the bond of union swelled in its whole length, proving that they had but one peritoneal cavity." See deductions of Vrolik, and Simpson, to be hereafter referred to.

A French observer,² (1836) over the initials E. L., says: "You can penetrate with a finger by the umbilicus into the abdomen."

M. Dubois³ (d'Amiens) made a very voluminous and chiefly psychological report to the Academie Royale de Medecine, in March, 1836. He formed an opinion that the abdominal cavities did not communicate.

M. Le Sauvage, (1837) previously quoted, was of the same opinion. He says, "I have positively established by all the facts of monstrosity by inclusion (in which the inclosed fœtus is always placed without the peritoneum) that this membrane does not cover the interior of the abdomen until after the arrival of the intestines; the reasons which have led to establish the isolation of the intestines, should have the same value as to the peritoneal membrane." On these grounds, he fully believed in the feasibility of separating the twins, and says: "The most difficult point, and one which requires the most attention, is the division of the complex umbilicus; it being there only, that we might fear to open one or other abdominal cavity. To avoid this grave inconvenience, I think we might separately divide the superior portion of the band, wait the cicatrization of the surfaces, and then include the remainder in a moderately tight ligature, with a view to produce at first, inflammation with gelatino-albuminous exudation, of the portions of peritoneal membrane which might be

¹ British and Foreign Med. Rev., 1841, vol. xii., p. 378.

² Journ. Heb. des progress des Sciences Med., 1836, vol. i., p. 30.

³ Memoirs de l'Academie Royale de Med., vol. v., p. 577.

included in the ligature; then their healing, and afterward the obliteration of the opening of one of the cavities, before the section was finally produced by the ligature."¹

Prof. W. Vrolik, of Amsterdam, (1841) in his work upon Double Monsters, takes up the subject of the Siamese twins, and expresses the opinion that they were most probably connected by some of the abdominal organs. He brings in illustration the figure of a closely analogous double fœtus (so far as outward conformation is concerned), and shows that in it *the two diaphragms met in the bond of union*, and were connected by a kind of third central tendon at the point of the united ensiform cartilages. *The peritoneums were separated*; but from each of them there was sent down near the middle of the bond of union, a prolongation, forming a kind of coronary ligament to a considerable portion of liver, which passed across the bond, and *connected the main masses of the livers to each fœtus*. All the other organs were completely separate.

Sir James Y. Simpson,² of Edinburgh, (1869) examined the twins with much care, upon the occasion of their last visit abroad. He attempted to illuminate the band by means of a powerful light placed behind it, but it proved to be too opaque. He tested their vascular connection by giving a dose of iodide of potassium to Eng, and then, after sufficient time, examining the urine of each by the starch test for iodine. This gave the characteristic colour with that of Eng, but no distinct trace with Chang's; a result which corresponded with the experiment made by Bolton, in 1830, under the effect of asparagus, given at one time to one, and at another to the other.

Prof. Simpson made his examination under great advantages, having had the experience of all those who were his predecessors to direct him in his explorations. He says:—

"That a large segment of peritoneum enters into the composition of the band on either side, is easily ascertained by touching it below, or laterally, and feeling the full impulse of bowel sent into the band, when the individual on that side coughs." . . . "That the peritoneal cavity extends entirely through the band is more doubtful." . . . "When you place your finger on the lower surface of the band, and the cicatrix of the umbilicus there, if the brother on the right coughs, he sends an impelled portion of bowel not only up to, but beyond the point touched; and in the same way, if the brother on the left coughs, the impelled bowel passes somewhat apparently to the right, beyond the site of the central umbilical cicatrix." He refers to the opinion of Bolton and says: "*The hernie project on either side beyond the middle, though possibly an oblique dissepiment of peritoneum may divide them.*"

It will be seen from the various opinions we have recorded, that the nature of the connecting band was very closely determinable by careful examination, and teratological analogy, during the lifetime of Eng and Chang. Observers differed very materially in their conclusions; for they varied in teratological knowledge, in their mode of physical exploration,

¹ Op. cit.

² Brit. Med. Journ., Feb. 1869, pp. 139 and 232.

and in the position in which they placed the brothers in relation to each other at the time of examination. The effect of the cough test was first discovered in this country, at a time when one brother had a severe cold, and was under medical treatment, after which it became a common mode of investigation. The lower peritoneal pouches were recognized in this way, but the upper were not found, because of their being hidden in large measure beneath the ensiform bridge. The connections between the diaphragms and livers not being recognizable by palpation, their existence was a matter of inference, based upon analogical cases, in which these organs have been found almost always united.

Prof. A. B. Cook,¹ of Louisville, in his paper upon "Joined Twins, their Obstetrical and Surgical Management," appears to hold to the belief that the livers were united, and says that a bond of union between livers might be much attenuated by pressure and tension, and speaks of the tolerance by the liver of such treatment. In the cases reported by Zwinger and Böhm, to be hereafter referred to, there does not appear to have been any hepatic connection, but in both the connecting band was much smaller proportionately than in the Siamese twins; and with their exception, very unique in character as compared with the generality of xiphopagous subjects. The length of the connecting band in cases of the type of the Siamese twins, must always be limited, as there can be no elongation beyond the combined measurement of the antifixated ensiform cartilages. But for this, the length would no doubt be gradually extended under the influence of constant traction. It has been thought by some that Eng and Chang had no true intervening band at birth, but that this was gradually developed by tension. This must be an error, if the position in birth has been correctly given, and their story of torsion in the plays of childhood is well founded. The fact that the ensiform cartilages are united end to end, would appear to indicate that a short, but regularly developed band existed at birth; and besides, the unavoidable tension of one foetal ellipse upon the other in utero would produce a band, where the union was as circumscribed as in the case in question, or its analogues reported by Zwinger and Böhm.

Whether the peritoneal pouches became gradually elongated or not, we cannot say, as they were independent of any external change; but the different testimonies of Bolton, in 1830, and Simpson, in 1869, would appear to indicate a prolongation of this kind beyond the central line of the band, which seems to have been their limit at the time of Bolton's examination. The attenuated character of the portal isthmus was no doubt, in some measure, due to the constant pulling of one liver upon the other, from gravity, position, and the respiratory movements; although from the small size of the whole connection between the brothers, it must have always

¹ Richmond and Louisville Journal, Jan. 1869, p. 65.

been quite an insignificant portal link, as compared with that found in ninety-nine hundredths of the omphalopagi.

Of omphalopagous twins, the Siamese appear to have very far outlived all their duplex analogues. The Hindoo sisters¹ described by Dr. Andrew Berry, lived to be nearly seven years old, and we have not been able to find an example of an intermediate age. In the Hindoo twins the union was a very extensive one, the girls standing directly face to face, with the tops of their sternums but $6\frac{1}{2}$ inches distant from each other, and pubes $8\frac{1}{2}$ inches. They were not examined after death, but as one was for some time nourished in infancy through food taken by the other, it is more than probable that their stomachs, and, judging from analogy, many of the viscera communicated, or were of double form, as the heart, liver, etc. They were well developed and active, but were obliged to walk sidewise, and to sleep facing, as they had no power to assume an oblique position. As appears in all duplex twins, one was much more robust than the other; but in this case the death of the stronger preceded that of the weaker, instead of the reverse, which appears to be almost universal in diplogenous cases.

Operations upon Xiphopagous Twins—The only instance of separation which resulted with entire success to both infants, is that which has been handed down from one writer to another, as the "König case;" and occasionally as the "Zwinger case," according to the volume of the *Ephemerides* originally consulted; Dr. Emanuel König having reported it in brief with a plate, in 1690, Dec. II. An. viii. page 305; and Dr. Theodore Zwinger (*Zwingerus*) much more minutely, in 1691, Dec. II. An. ix. page 291. The fact is that neither of these physicians delivered the mother, or operated upon the children, a midwife having attended to the first, and Dr. Fatio, the second, who also furnished to Dr. Zwinger the statement given under his name. It has also been said in ignorance, that this operation was not well authenticated; when the fact is, that all the details of the case, and the names of the parties engaged, with their positions, etc., are carefully recorded, showing that the witnesses were numerous and reliable. To avoid confusion of titles, we will speak of the case as that of

The United Swiss Sisters, reported by König, and Zwinger, and successfully separated by Dr. Fatio of Basle, in 1689.—We do not propose to translate the original account of Dr. Fatio, with the high-sounding titles he has given to the physicians and surgeons present at the first operation, and distinguished citizens in addition at the second, except to a very limited degree, preferring to condense and simplify the language so as to give a plain statement of the case as follows:—

"The most illustrious, etc., Dr. Emanuel König, gives an account in the *Ephemerides*, An. viii. 1690, of the wonderful birth of twin girls, born joined together; but since *he was not present at the consultation*, in which

¹ Trans. Med. Chirurg. Soc. Edinburgh, 1821, vol. 2, p. 35.

the mode of separation was discussed, he has been pleased to give me [Dr. Zwinger] an account written by the operator himself, Dr. Fatio, as follows:”—

Clementia M., wife of Martin D., aged 42, mother of three children born singly, gave birth to twins joined at the umbilicus, at Hattingen,¹ in the diocese of Basil (Basle), on November 14th, 1689, after a labour of not more than two hours. Their father had them baptized Elizabeth and Catharine, and on the next day took them “to the house of Dr. Samuel Braun, a surgeon of no small reputation, and asked of him professional aid.” Dr. Braun called Dr. Fatio in consultation, and they, on account of the peculiarity and importance of the case, obtained the additional opinions of Drs. Nicholas Eglinger, Theodore Zwinger, Francis Plater, and Frederick Bauhin.

The connecting band is stated to have been formed by a coalition of the xiphoid cartilages, and umbilical vessels, surrounded by areolar tissue, and covered with skin, with a very thick umbilical cord attached to its lower surface. It measured an inch and a half in length, one inch in thickness, and five inches in circumference, which would give a vertical diameter of about two inches. The double funis had been cut and tied by the midwife, at a length of about eight inches, which was found of advantage in the method of operation adopted by the consultation. This was to separate the cord up to its division in the band, tie the vessels to prevent hemorrhage, ligate the band below the cartilaginous link, and when the ligature cut its way out, sever the cartilages by incision.

The description of Dr. Fatio in the original Latin, although very minute, is rendered obscure by the use of newly devised terms, and anatomical expressions of doubtful meaning, so that we are obliged to recur to the intention to decipher the steps of the operation. It would appear from what he states, that when the children cried the band above the umbilical junction “*appeared thick and swollen*,” and that between this and the united cartilages was an almost imperceptible “*isthmus*.” The first of these would lead us to believe that there might have been hernial protrusions into the band from either side toward the umbilical ring; but the examination of the context does not throw any light upon the meaning of the term “*isthmus*,” which is used in two other places, in a way to indicate that it did not apply to a connection of any note, and did not represent a union by a band of homogeneous tissue as in a hepatic isthmus. In the sections of the band given in König’s plate (An. viii.), nothing is represented but the cartilages, vessels, areolar tissue, and skin.

After the cords were separated and tied, Dr. Fatio perforated the band with needles, and ligated all below the ensiform bridge, using a second ligature of six wires, thrice carried around, to be tied tighter and tighter, until all the included parts were divided. The ligature having fallen off in nine days, the ensiform connection was severed by a bistoury on November 23d, 1689, in the presence of several physicians, surgeons, and distinguished citizens of the town of “Basil.” The parts healed in ten

¹ Probably the present Hattingen, 4 miles north of Basle.

days, and six months afterwards the twins and mother were reported as in good health.

The report of this case by König, having been issued with a plate, appears to have attracted the attention of observers, who from a want of an illustration, have failed to notice the much better one in the succeeding number of the *Ephemerides*, even such close investigators as St. Hilaire having failed to discover it. We have, therefore, been all the more particular in our own reference to it, and also for the reason that the statement of König is very unsatisfactory, and his measurements entirely in error. It is impossible to determine whether any peritoneum was involved in the ligation or not, as the surfaces revealed were not exposed to view for nine days, and did not show at this date the minute anatomy of the tissues cut through. It is quite possible that peritoneum may have been gradually closed by adhesive inflammation, and divided before the ligature, unless the separation of the cord in the first step of the operation effectually divided from each other the herniæ which appeared to protrude towards the centre from either side under the force of crying.

*Dr. Böhm of Gunzenhausen's case of United Twins separated by Incision.*¹—The reporter of this case, was both obstetrician and operator, and it has been said also the father of the twins. The mother was a healthy woman, 25 years old, and had previously been delivered of two living girls at single births. The united ones were delivered by the feet without any special difficulty, as they were small, and their mother's pelvis of large size, on December 25th, 1860. The children, who were a little premature, were united sternum to sternum, but otherwise well formed. The description of the connecting band shows it to have been about the size of that in the Swiss twins, and measured five and a half centimetres vertically, or about two inches. It felt soft, except at the top, where the ensiform cartilages united.

Dr. Böhm performed an immediate operation. He separated the umbilical cord up to its entrance, and tied each half by itself; then made a vertical incision into the band and carefully keeping to the median line, cutting into it very cautiously, reached and divided the cartilages, and then the remainder on the rear side. No vessels were tied, and the incised surfaces were drawn together by three button sutures, lint applied, and then a binder. The children were very much prostrated by the operation, but a resort to a warm bath soon restored them, so that they were able to nurse. The sutures were removed on the third day, and the parts healed mainly by the first intention. One of the children was feeble from the first, and died in three and a half days. The other was nearly five years old when the case was published, healthy, but small of her age. The cicatrix forms folds which radiate from a much wrinkled navel. In the median line is a parting of the linea alba, which, when the report was made, measured nine centimetres long, and three and a half wide. The distance from the lower end of the cicatrix to the pubes, was $4\frac{5}{8}$ inches. When the abdominal muscles contract, the contents of the abdomen are protruded between the recti muscles, in the form of an oval eminence. This does not interfere with the proper functions of the abdominal viscera.

¹ Virchow's Archives, 1866, page 152.

The want of the same degree of success that was achieved in the previous case, appears to have been due to the fact that the birth was somewhat premature, the infants small and feeble, and the operation immediately by incision, instead of slowly by ligation, and only a small part by the knife. Had these children been operated upon at a later period, it is probable that the result would have been more favourable. As it was, both nearly succumbed from the shock of the operation, and the one that died eventually, never seemed to have reacted properly after its performance. The only advantage of an immediate operation is, that the umbilical cord can be then more readily separated to its bifurcation; but this step might be attained, and the division established by a partial operation, leaving the more severe portion until an age when it might be more safely performed.

*The Armenian Twins.*¹—"Under the Roman reign (A. D. 945) two male children were brought from Armenia to Constantinople, well formed in all their extremities, who were united by their abdomens. After they had been for some time an object of curiosity, they were removed under order of government, as it was feared that this accident of nature was a presage of evil. They returned at the commencement of the reign of Constantine VII., and one of them dying, the surgeons undertook to preserve the other by separating him from the corpse. All their skill failed; the second died in three days after the operation."

This case having been several times referred to in teratological monographs, we have made a full translation of the original, such as it is. It is probable that they died at an early age.

General Remarks.—Förster has tabulated 114 examples of omphalopagous twins, upon but one of which was there any operation of separation performed; and from the numbers of this type we have recently met with in our researches, it would be no difficult matter to largely increase this list. In the great majority of cases there is no true *band* of connection, but simply a blending of the thoracic and abdominal walls, bringing the foetuses closely face to face, as in the Hindoo Twins already referred to. In these cases, the viscus which is almost universally duplex, is the liver; and this may be found when the abdominal cavities, and all the remaining viscera are separate. In the Zyphodidymi, of the *narrow-band-type*, we must be prepared to expect that an operation may lay open the peritoneal cavity, and cut through a hepatic connection, most probably containing some true liver tissue. This being the case, ligation by slow degrees is much to be preferred to the knife, as adhesion may be thus effected before the band is finally cut through.

The cases upon record show that those which are born alive are generally small, usually feeble, and sometimes premature, so that they are not in a condition to recommend an immediate operation. Had Eng and Chang been separated soon after birth, they would in all probability have perished, but might have been disconnected by slow ligation, when suf-

¹ L'Histoire du Bas Empire, per La Beau. 1776, Liv. 74, vol. xvi., p. 28.

ficiently grown to have borne the operation. If their social position had been the reverse, and their birth taken place in an enlightened country, they would no doubt have been separated in infancy; but not having an opportunity until old enough to think for themselves, they chose to remain as nature made them; evincing their opposition to the proposal of disconnection, at one time by shedding tears; another by anger; and always by dissent; so that it was never, except in theory, a question for surgical opinion.

Xiphopagous twins are more frequently of the female sex, and are born with much less difficulty than from their nature might be supposed. Being, as already remarked, usually of small size, they are not infrequently delivered without any more than the ordinary manual assistance, after a short labour, and particularly so where the pelvis is large, and the feet present together; but both podalic and cephalic presentations may be regarded as favourable. Injurious interference will often lead to the death of the children when unassisted nature may be able in time to deliver them alive. The management of the labour will depend very much upon the relative dimensions of the twins and pelvis; the position of the former, and the stage at which assistance is obtained. The most common causes of death are pressure upon the large funis; and the means resorted to to deliver in cases of impaction in the pelvis, such as section, evisceration, etc. It is also probable that many do not respire after birth, because of imperfect organization of the nerves and circulatory organs; but judging from the case of the Hindoo Twins, who belonged to one of the most common omphalopagous varieties, it would appear that many might live, if not destroyed in the pelvic canal by manual or instrumental violence. The desirability of such a result is a question entirely separate from its possibility. We feel called upon often to attempt to save or prolong life when, in our judgment, its continuance can hardly be thought desirable. As we cannot know exactly the character of union, or the degree of perfection in the children united, until they shall have been delivered, it is best in all cases to exercise every degree of precaution, and particularly so, as it may prove possible to separate them after birth, as in the Swiss Sisters.

Our recollection of the Siamese Twins is based upon their appearance as presented to us when they were about twenty-five years of age, at which time they were of the colour and appearance of some of the Chinese now in this country. As they grew older they became darker in skin, especially of their faces; and the band had more of a brownish hue. Their heads were not of typical shape as indicative of race, being large, high, and somewhat square, Eng's measuring in circumference $23\frac{3}{4}$ inches, and Chang's $22\frac{1}{2}$ inches. Although exhibited in our chief cities, and long resident in the United States, they never appear to have attracted the scientific interest here that they did in Europe, and scarcely any reference is made to them

in our medical journals from 1829 until after their death ; so that we have been obliged to quote foreign articles almost entirely when considering their anatomical connection, and the question of separation.

We have been repeatedly asked the question, " Could they have been safely disunited ?" and upon this appears to centre with the community, the whole interest in their case—it being long ago established that they were mentally, morally, and physically quite unlike—there still remained to be settled the question as to the possibility of making them independent beings by a surgical operation, so that they should be in all respects separate and distinct. We have also been asked if the autopsy showed the band to have been different from what it was expected should be found.

To the first question we reply that the opinion has been almost universal, that it was quite possible to separate them by slow degrees with safety, but that the operation must necessarily be attended with the usual risks of those practised upon the abdominal parietes involving the peritoneum. This opinion has not been materially altered by the revelations of the post-mortem examination. An immediate operation by the knife, would probably have been of equal gravity with one of ovariectomy ; but that proposed by Le Sauvage promised much more favourably

The second query can only be answered by reference to the combined views of numerous investigators. No one observer formed a correct opinion as to the entire anatomy of the band ; but collectively, Bolton, Simpson, Cook, Vrolik, and Warren, may be said either to have found, or established by analogy, the existence of almost every important feature shown by the autopsy, viz., the lower peritoneal pouches of, first, Chang at the bottom of the band, coming into it from the left ; and, second, Eng just above, and overlapping it from the right ; the hepatic connection ; the ensiform connection and joint ; the interlacing of the diaphragms ; and the independence of the two peritoneal cavities, and of the intestines. This covers all the features revealed, except the infra-xyphoid peritoneal pouch of Chang, and the slight vascular intercommunication of the livers shown by the coloured injection, passed from Chang into Eng.

It must be admitted that the character of the band was sufficiently well established during life to enable a surgeon to decide intelligently as to the risks of an operation of severance. All of the Surgeons consulted in Europe in 1869, held that the twins were not at an age to admit of the performance of the operation with any but the faintest hope of a favourable result. They were then 57 years old ; Chang was quite intemperate, and soon afterwards became hemiplegic ; and both probably had diseased arteries, as they were found atheromatous, and had undergone calcareous degeneration at the time of their death, five years later. But this was not the calculation of risk given when Eng and Chang were young and active.

ART. V.—*A Contribution to the Etiology of Diseases of the Internal Ear.*

By D. B. ST. JOHN ROOSA, M.D., Professor of Diseases of the Eye and Ear in the University of the City of New York, Surgeon to the Manhattan Eye and Ear Hospital. Read before the Society of Neurology and Electrology, April 20, 1874.

THE later investigations in otology have given us all pretty accurate notions as to the general character of those comparatively rare affections, diseases of the internal ear. We are now in no danger, in the great majority of instances, of confounding the insidious affections of the tympanic cavity with those of the labyrinth or of the auditory nerve; the symptoms and pathology having been so clearly marked out that those who run may read, but we are still often puzzled in determining whether a given disease of the internal ear proceeds primarily from the brain, from the tympanic cavity, from some lesion of the auditory nerve, or of its expansion in the vestibule, semicircular canals, and cochlea.

The most conclusive solution of these important problems is to be found in *post-mortem* examinations of those cases which have been carefully observed, as to their aural symptoms, during life, but while waiting for the pathologist, the clinician may contribute his mite toward the desired end. To this end I have carefully collated from the records of my private practice, during the past ten years, those cases of impairment or loss of hearing in which the diagnosis of disease of the internal ear has been made, with the special object of ascertaining what they may teach, and how they may be classified. The published records of *post-mortem* examinations of cases having similar histories, in some few instances have given a warrant for the classification adopted, but, in the main, they will be found to be purely clinical, and lacking, as yet, that positive demonstration which the dead-house alone can furnish. As I have indicated, it is frequently difficult to fix upon the starting-point of a well-defined disease, and more especially in aural affections. An affection of the middle ear, for instance, may soon become one of the nerves, in spite of the fact that the vascular connection is not very intimate; while one of the brain, by one of the numerous channels for extension, readily becomes an affection of the internal or middle ear. Thus diseases overlap each other, and a narrow, special view becomes impossible to the true scientific observer. The etiology of diseases of the internal ear becomes one of immense importance to every man whose duty and vocation it is to study the phenomena of disease. The cases that I have diagnosticated as predominantly affections of the internal ear, amount to 65 out of an aggregate of 1700, constituting about $3\frac{3}{4}$ per cent. of the whole. This proportion is about the same as that obtained by the more recent writers, and by the statistics of institutions where aural diseases are treated. I would also remark that I have carefully excluded

from my statements any cases which were plainly secondary to affections of the middle ear; for example, the suppurative affections of the labyrinth, which evidently began in the tympanic cavity, but which resulted in the impairment of the nervous apparatus, have been classified with the affections of the middle ear. There is a sense in which all cases having, as one of their chief symptoms, tinnitus aurium, are affections of the cochlea; and yet, if the pressure upon the ultimate fibres of the acoustic nerves be caused by the rigidity of the stapes upon the fenestra ovalis, or of thickened mucous membrane, or by inspissated pus upon the fenestra rotunda, we must, I suppose, name the affection, not from its most disturbing symptom, but from its cause. The study of tinnitus aurium, indeed, is much more properly made from affections of the middle ear than from those of the nerve, for, in primary affections of the nerve, the lesion is so profound, or the pressure upon the ultimate fibres is so evenly diffused, or their destruction is so complete, that even the perceptions of irregular vibrations of the auditory rods that we call tinnitis are often abolished, just as there may be eyes in which there are not even flashes of light. Patients with disease of the internal ear do not usually complain of tinnitis; they usually speak of it as a low murmuring noise, to which they pay very little attention; whereas, those who have a tinnitis that is caused by pressure through the fenestræ upon the labyrinth—that is, from the tinnitis of disease of the middle or external ear—are usually very much disturbed by it.

As germane to this subject, I may mention the case of a young woman suffering tinnitus aurium, arising from disease of the middle ear, which was especially annoying to her highly cultivated musical taste, because the tinnitis kept upon certain notes for a long period, and then turned to another. This lady kept a record of the monotonous concert which she was obliged to hear, of which I present a few specimens:—

Feb. 13, Morn.	C sharp, B flat, F sharp, in right	B in left.
" Night	E flat, C flat, A	" "
Feb. 14, Morn.	" " "	" "
" Night	C sharp, B flat, F sharp,	" "
Feb. 15, Morn.	" " "	" "
" Night	" " "	" "
Feb. 16, Morn.	" " "	" "
" Night	F sharp, E flat, B	" "
Feb. 17, Morn.	D B G	" "
" Night	" " "	" "
Feb. 18, Morn.	E C sharp, A	" "
" Night	D B G	" "
Feb. 19, Morn.	F sharp, E flat, B	" "
" Night	D B G	" "
Feb. 20, Morn.	C sharp, B flat, F sharp	" "
" Night	" " "	" "

The diagnosis of diseases of the internal ear is not as purely objective as could be wished. In many cases we are obliged to depend on negative symptoms, which are apt to be deceptive. Since the introduction of the tuning-fork into practice, however, we have been greatly assisted; and if we could induce our patients to give up the preconceived notion, that, be-

cause they hear a watch tick better with one ear, they must also of necessity hear a tuning-fork placed on the forehead, or teeth, better, on the same side, we should make a much greater advance. As it is, however, diseases of the internal ear get the benefit of the doubt, and only those are classified among them, that cannot be at all fairly placed among those of the middle ear, so that future investigations will probably rather increase than lessen the proportion of nerve disease, unless we shall find that cerebro-spinal meningitis does not so often destroy the auditory nerve, as has been supposed by many, and unless we cease to consider every congenital or intra-uterine affection of the ear as one of the nerve.

A very natural, but rather vague classification of diseases of the internal ear may be made by dividing them into the traumatic and idiopathic varieties.

Traumatic Causes.—The history of the traumatic cases is usually so plain, and the results of examination are so positive, that we have no room for doubt as to their etiology. Five of my cases were clearly of a traumatic nature; and eleven others should have been so classified, I think, although they were cases in which the lesion of the nerve was not caused by a direct blow or fall upon the bony covering of the ear, but by a constant life amid the rapidly and constantly occurring vibrations incident to boiler-making, or the incessant click of telegraph instruments. The histories of these cases will furnish the data which led to the diagnosis.

CASE I. Severe fall; complete deafness on one side; normal drum membranes.—Sept. 14, 1865. E. M., æt. 11, five years ago, or when six years old, had a severe fall down stairs, striking his head, and he has been totally deaf on the right side ever since. The drumheads of both sides are normal. He cannot hear the ticking of the watch on the right side, except when upon the mastoid region, the meatus being closed. The air is easily forced through both tubes by Politzer's method and by the experiment of Valsalva, but no improvement to the hearing results.

CASE II. Profound deafness from blows on the head.—St. Vincent's Hospital, Jan. 6, 1868. This man, æt. 45, was severely beaten in a fight some few months since; he was unconscious for four days, and, when restored to consciousness, was perfectly deaf, in which condition he still remains. His gait is irregular; finds great difficulty in keeping his head in an erect position, even when supporting it with his hand. Marks of blows are still traceable over one eye and the right mastoid process. There seems to be an entire absence of hearing power, as found by all the tests capable of application. He seems very much dejected, but is well nourished. Both membranæ tympani, especially the left, appear sunken, and have lost their transparency. Air enters both ears by Politzer's method; the pharynx is in fair condition.

I think we may fairly conclude, in this case, that the blows produced an inflammatory action in the nerve, as well as in the meninges of the brain and the parts of the middle ear, and this is probably the ultimate lesion in the case of blows and falls. The bloodvessels are perhaps at first ruptured; and we know, from post-mortems in similar cases, that suppurative

inflammation of the labyrinth and basilar meningitis have resulted. In ophthalmic practice we observe cases in which atrophy of the optic nerve follows severe injuries upon the side of the head; but this atrophy presents no ophthalmoscopic appearances at first—or at least very few, and may affect but one nerve. The fact that each ear, unlike the eye, is an independent organ, often saves the victim of severe injuries on one side from total deafness.

In the following case, it may perhaps be questioned whether the lesion was not chiefly in the middle ear, since there was some considerable hearing power remaining; but the fact of the existence of hearing power by no means excludes the labyrinth as the seat of the disease. It has been shown that the semicircular canals may be destroyed by suppuration; and yet, so long as the cochlea remains, there will be some hearing power.

CASE III. *Severe injury; increase of previously existing impairment of hearing.*—A gentleman, æt. 33, was a passenger in one of the cars that were thrown off the track, and precipitated upwards of 100 feet down an embankment in the famous Angola accident. He received a severe injury in the occipital region especially. He had some difficulty in hearing in the right ear before the accident, but immediately afterwards, the deafness was materially increased. Ten days subsequently, he suffered considerable pain in the right ear, beside certain head symptoms. There is tinnitus aurium in the left ear, but none in the right. The right drumhead is very much sunken and has no light spot. There is some pharyngitis. Hearing distance: right watch $\frac{0}{48}$, left $\frac{1}{48}$.

CASE IV. *Blow over mastoid process; pain, vomiting, very great loss of hearing.*—Joseph A., æt. 13, five weeks ago was struck over the mastoid process by a croquet mallet; which stunned him very much, and he vomited frequently for the first few days. One week after the accident he had pains in the ear that lasted for half a day, but there was no bleeding. He hears the watch ticking, when pressed upon the right ear. The hearing distance is normal from the left side. The tuning-fork is not heard at all on the right side, unless the meatus is closed by the hand.

I have seen two cases of nerve disease in telegraph operators: one of tinnitus aurium without impairment of hearing; and the other showing great impairment in the ear that was turned towards the apparatus when in the act of listening. I was disposed to treat the first case as merely coincidental; but when the second occurred, and others had been brought under my notice, I was compelled to admit them into the same category as those familiarly known as boiler-maker's deafness.

There can be, I think, no hesitancy in believing that the continual recurrence of one kind of sound, having no musical, but, on the contrary, an unpleasant character must at last cause a congestion of the ultimate nerve fibre in the cochlea. The incessant shock or concussion made upon the drumhead by the blows from dozens or even hundreds of hammers upon vibrating plates, must agitate these fibres in such a manner as to put them out of tune, as certainly as the constant use of the piano will at last loosen its strings. Clinical experience confirms this; and my own observations

and investigations in reference to boiler-makers' shops, seem to demonstrate the following facts :—

I. Boiler-makers are nearly all hard of hearing ; and those who are not have, as a rule, taken the wise precaution of plugging the external meatus with cotton, so as to diminish the force of the sound-wave upon the drum-head.

II. The impairment of hearing is generally attributable to some lesion of the labyrinth, probably of the cochlea ; for the chief symptoms are loss of hearing, and tinnitus aurium ; there is no vertigo, or staggering in the gait.

Superadded to this serious trouble, tympanic or middle ear catarrh is very frequently present, but these must be regarded as purely coincidental. Boiler-makers are constantly exposed to sudden and marked changes of temperature, and hence often catch cold, intensifying and increasing, by this means, the ear affection.

Should a man, already suffering from disease of the middle ear, begin to work in a boiler-shop, he will, of course, suffer in a much greater degree and the organ be more susceptible of additional injury than a man who is in the enjoyment of a sound organ of hearing. Dr. D. R. Ambrose has shown me a case which confirms this view. In the same way, a telegraph operator who has pharyngeal catarrh, and consequently a swelled Eustachian tube, which is not always capable of performing its proper function, will be more sensitive to, and suffer more acutely from, the concussions of the instrument than he who has a healthy throat. The existence of tympanic and tubal catarrh will cause the Eustachian passage to be less pervious, or even at times entirely closed ; and thus aggravate the unpleasant conditions existing when waves of sound that have to go but a short distance, and are besides inclosed in tubes, and thus increased in intensity, impinge upon the molecules that make up the ultimate fibres of the auditory nerve.

Those who work inside the boilers as riveters, and who thus have shorter waves of sound striking upon their ears, lose their hearing power most completely, as is evidenced by the testimony of all old boiler-makers. It is not easy, in the absence of post-mortem investigations, to define the exact nature of the lesion, but it may probably be a passive congestion of the contents of the cochlea. If care were taken to deaden the sound—that is, to interrupt the vibrations by the use of the cotton plug—I have no doubt but that the hearing power of boiler-makers might be materially preserved. One of the cases already alluded to, which will be given below, is a striking exemplification of what may be accomplished in this respect.¹

CASE V. *Tinnitus aurium, without impairment of hearing ; occurring from listening to a telegraph instrument.*—W. G. B., æt. 37, states that

¹ I am indebted to Hon. Robert P. Parrot, of Cold Spring, and Dr. F. D. Lente for the opportunity of seeing these cases.

he has been a telegraph operator for about twenty years, and that he has had tinnitus aurium for about two years. Hearing distance: right $\frac{4}{8}$, left $\frac{4}{8}$. Both membranæ tympani have good light spots; there is some granular pharyngitis. The patient is confident that the vibrations of the telegraphic instrument have caused the noise in his ears. The sound of the instrument is very unpleasant to him, and he is obliged to protect his ears while at work by cotton plugs. Indeed, his ears have got into such a sensitive condition that jarring sounds of any kind are extremely annoying to him. The patient is in good general health.

CASE VI. *Impairment of hearing of one side, ascribed to occupation as telegraph operator.*—May 4, 1870. Mr. B., æt. 27, about a year ago, discovered that the hearing power of his left ear was somewhat impaired. Three months ago he was troubled with a continuous noise in that part of his head. He is a telegraph operator, and has been accustomed to use his left ear—leaning his head over the machine on that side and intently listening. He believes that this is the cause of his loss of hearing. The drumheads look very much alike, both exhibiting peripheral opacities, but in other respects having a normal appearance. The pharynx and nares seem to be healthy. Inflation of the ears has no effect upon the hearing. The watch is not heard at all on the affected side, nor is the tuning-fork.

CASE I. *Boiler-makers' deafness; impairment of hearing; absence of tinnitus aurium.*—W. B., æt. 64, has been a boiler-maker for 33 years, and heard perfectly well before he began to work at that business. He has never had "earache;" his hearing began to fail him four or five years after his entering the shop. Hearing distance: right $\frac{0}{8}$, left $\frac{0}{8}$. Tuning-fork not heard when the handle is placed upon the forehead, but distinctly audible when placed on the teeth. Membranæ tympani: right, manubrium distinct, light spot of good shape; left, the same appearances. He has no tinnitus aurium; he hears conversation better in the noise of a shop than outside, but he cannot hear the watch any further. Politzer's method does not improve the case or the hearing power; nor is the air felt to enter the ear.

The interesting question of why it is that some persons afflicted with impairment of the hearing hear better in the midst of noise, occurs naturally in discussing this subject. The fact is that, while these patients hear conversations better in the midst of noise, they cannot hear the tick of a watch at any greater distance. I have simply to say, that all the explanations as yet given seem to me totally inadequate to explain the phenomenon. So far from the drumhead being relaxed in these cases, it is very often extremely rigid.

CASE II. *Boiler-maker eight years; gradual loss of hearing.*—Robert B., son of preceding, æt. 23, has been in boiler-shop eight years, had heard well before he entered the shop, but he finds that he is gradually losing his hearing power. Hearing distance: right $\frac{1}{8}$, left $\frac{1}{8}$. Tuning-fork is plainly heard in both ears; membranæ tympani normal in both sides. The employment of Politzer's method slightly improves the hearing.

CASE III. *Boiler-maker thirteen years; tympanic as well as labyrinth disease.*—W. B., æt. 30, has been thirteen years in the shop, and finds that his hearing is becoming impaired; had earache occasionally, and a discharge from one of the ears for a short time. Some years ago suppura-

tion occurred which soon ceased. Hearing distance: right $\frac{48}{48}$, left $\frac{3}{48}$. Tuning-fork heard better in right ear. There is no tinnitus. The right ear drum is concealed from view by hard wax; the left is normal in appearance.

It is possible that the impairment in hearing in this case was due to a catarrhal process that occurred years before, but there were no evidences of this in the left drumhead. On the other hand, the wax may have acted to protect the right ear. The use of Politzer's method did not improve the hearing.

CASE IV. *Boiler-maker; great impairment of hearing.*—Mc—, æt. 64, is confident he heard well before entering the shop. Never had earache nor a discharge from the ear. Hearing distance: right $\frac{0}{48}$, left $\frac{0}{48}$. The tuning-fork is heard well when placed upon the teeth, but not when on the forehead. The membranæ tympani are not quite as transparent as normal, but there are good light spots in each of them. There is no tinnitus aurium. Politzer's method has no effect upon the hearing power.

CASE V. *Boiler-maker; great impairment of hearing.*—S., æt. 66, heard well before entering the shop. Never had earache or a discharge from the ear. Hearing distance: right $\frac{0}{48}$, left $\frac{0}{48}$. Right membrana tympani covered by hardened cerumen; left a little sunken. Tuning-fork heard better in the ear containing the wax.

CASE VI. *Boiler-maker; considerable impairment of hearing; some middle ear catarrh.*—G., æt. 29, his hearing is becoming impaired; heard well before going into the shop. He had no earache nor discharge from the ear. Hearing distance: right $\frac{2}{48}$, left $\frac{0}{48}$. Tuning-fork heard equally well on both sides when placed upon the forehead, but heard better in the right ear when placed on the teeth. Complains of a buzzing noise in his ears. The use of Politzer's method increases the hearing distance to $\frac{3}{48}$ on the right side.

CASE VII. *Boiler-maker seventeen years; good hearing; protection of ears.*—Z., æt. 29, he states that he hears well; has always worn cotton in his ears when in the shop, because he "could not stand the noise;" has been very particular about this, and ascribes the good hearing power that he enjoys to this care. Both membranæ tympani are normal in appearance. Hearing distance: right $\frac{30}{48}$, left $\frac{30}{48}$, and is still further improved by the use of Politzer's method.

CASE VIII. *Boiler-maker eight years; supposed good hearing power; actual loss.*—X., æt. 22, thinks he hears well; hearing distance: right, watch when laid upon the ear; left, the same. Has some tinnitus aurium. The tuning-fork is heard distinctly. Right membrana tympani has a small light spot; left has none at all. Inflation by Politzer's method improves the hearing somewhat.

Inasmuch as the boiler-makers were not examined in private practice, I do not include them in the 1700 cases from which the other cases are taken, and they are numbered by themselves.

CASE VII. *Exposure to cannonading; tinnitus; impairment of some of the ultimate fibres.*—Feb. 11, 1868. W. R. X., æt. 25, observed some difficulty in hearing ten years ago; and, after being exposed on a gun-boat to some cannonading, while an officer in the navy, he became worse, although he has scarcely any tinnitus aurium. Hearing distance: right ear $\frac{1}{48}$, left

ear $\frac{1}{8}$. Both drumheads appear to be normal. Air enters each Eustachian tube freely, but causes no improvement in the hearing power.

I have had ample opportunity to test the hearing power of this patient in conversation, which he hears so well, in spite of the fact that his power of hearing the watch is much impaired, that he has never been considered by any, but his most intimate friends, as very hard of hearing. Persons who can hear the watch no better than he, are usually, if not almost always, very much troubled to hear conversation even when addressed especially to them; and yet the patient in question could join in general conversation carried on in an ordinary tone, and can hear lectures, etc., with perfect ease.

Hemorrhagic and Inflammatory Causes.—The exact nature of the idiopathic cases of diseases of the internal ear is perhaps not so clear as that of the traumatic variety, but judging from the cases that I have seen, we may fairly adopt the classification that ranges them under the following heads: Hemorrhagic and Inflammatory.

The hemorrhagic or apoplectiform are those that occur very suddenly, and so far as we at present know, hemorrhage may occur into the cochlea and semicircular canals in persons who have previously had good health, and in whose bloodvessels there are no other evidences of breaking down. *A priori*, we should conclude that patients suffering from Bright's disease might have hemorrhage into the labyrinth, but as a clinical fact, in the few cases that have been observed of hemorrhage into the ear in cases of Bright's disease, the bleeding occurred in the middle and not in the internal ear. Menière's somewhat famous cases—which all began suddenly—or, at least, the prominent symptoms of deafness, vertigo, nausea appeared suddenly—were probably hemorrhagic. One of them we know did, for the post-mortem examination revealed a healthy cerebrum, cerebellum, and spinal cord, but bloody exudation in the semicircular canals. It is only the suddenness and consonance in the occurrence of those symptoms that make a pure case of primary disease of the internal ear, for all of them may occur where a patient has had disease of the middle ear for several years, which has at length passed into the labyrinth.

Mr. Hinton relates a case¹ which has an amusing aspect, since sudden and profound deafness occurred in a young fellow in perfect health, and in the possession of all his faculties, who was about to call upon the parents of the young lady who afterwards became his wife, for the purpose of asking her hand in marriage. This gentleman recovered to some extent, probably from the good effects of a favourable reply.

Ten of the cases out of the entire number forming the basis of the remarks contained in this paper, were apparently of this hemorrhagic or exudative character, though it may be that it is not always blood that is suddenly effused.

¹ Nervous Deafness, reprinted from Guy's Hospital Reports.

CASE VIII. *Sudden and complete loss of hearing power, supervening on old aural trouble.*—July 21, 1865. Mrs. S. D. M., æt. 28, states that she has not heard well from the right ear for some years. Eighteen months since, the hearing power of the left ear was suddenly lost, when the patient was in feeble general health. There is no history or appearance of syphilis or other constitutional disease. She has had two children; the last one was born two years since. The patient is a pale, slight woman, but her appetite is good and the general nutrition seems to be fair. The hearing power appears to have entirely left her. She cannot hear the ticking of the watch, no matter where it may be placed—and cannot distinguish the sounds of the human voice, even through a speaking tube.

The right membrana tympani is opaque; it has no light spot, and is immovable; the left one not quite so opaque. The patient's voice is natural in tone and modulation.

The air enters both Eustachian tubes by the use of Politzer's method. In September, after the inflation of the ear, the use of iodide of potassium, and a still further improvement in the general health, the patient could hear the sound of a voice through the tube; but she did not get beyond this point so long as she remained under my observation, which was some six months.

CASE IX. *Sudden loss of hearing on one side.*—Sept. 5, 1866. J. F. T., æt. 50, a very active business man, about a year and a half ago, suddenly observed a noise in his left ear, and found, on examination, by means of the ticking of a watch and by conversation, that he was deaf on that side. The deafness still continues, and at times he is subject to attacks of dizziness. The watch is not heard at all on the affected side. The drumhead is somewhat opaque, especially in one spot, and it is rigid, scarcely movable. There is some chronic pharyngitis. The hearing power of the other ear is normal.

The patient was treated by the use of the vapor of muriate of ammonia through the Eustachian tube—through the catheter, and astringent applications to the pharynx. The hearing power increased to $\frac{1}{48}$, and the attacks of vertigo disappeared. I have frequently seen this patient since he passed from under my professional supervision. His hearing power consists in an ability to hear the watch when placed upon the auricle. The attacks of vertigo are very infrequent, and the patient is still (though suffering from this affection for nine years) engaged in active business life.

CASE X. *Sudden tinnitus, nausea, vertigo, deafness.*—Jan. 2, 1866, Mr. M., æt. about 55, was brought to me by his son, a physician of this city. About a year since, a noise suddenly occurred in the patient's right ear, and it has persisted since that time. At times he has been very much troubled by vertigo and nausea. Hearing distance: right ear, $\frac{1}{30}$; left ear, $\frac{3}{80}$. Both drumheads have opacities, but they present good light spots, and are movable. There is some pharyngeal catarrh; the general health is good, but the patient lives a sedentary life, being a bank officer.

At the time I first saw this patient, I was not in the habit of using the tuning-fork in diagnosis; but, seven years later, I again had the opportunity of examining his ear. It probably primarily involved the vestibule and semicircular canals; for the vertigo and nausea were prominent symptoms, even when there was considerable hearing power. We can scarcely, I think, conceive of extended affection of the cochlea, without complete loss of hearing. When last I saw Mr. M., the hearing power was so much diminished, that he could only hear the watch when pressed upon the ear.

Fits of dizziness and nausea still continue to recur. The membranæ tympani still look tolerably well. They have well-defined light spots; but, on practising Politzer's method, it is only by the use of the vapour of chloroform that any sensation is experienced in the tympanic cavity.

I have often observed that it is very difficult to cause any sensation from the use of Politzer's method on persons who have been deaf for some time from a nerve affection, but the reason for this I have never been able to understand.

CASE XI. *Vertigo; vomiting at intervals for nineteen years; sudden deafness on one side.*—Jan. 13, 1868. Mrs. F., æt. 39, for eighteen or nineteen years has had, at irregular intervals, attacks of vertigo and vomiting. For a long time they ceased; but about a year ago they recurred with increased severity. Three or four years since, she found that she could not hear well on the left side, and that she had a singing noise in the ear. The watch is heard $\frac{2}{4}$ on the right side, not at all on the left. The pharynx is normal in appearance, as is the right drumhead. The left is very much sunken, but normal in colour. The air does not enter the tympanic cavity well. The patient remained under observation for some eight months, and was relieved of the vertigo after taking iodide of potassium.

CASE XII. *Sudden deafness ascribed to checked perspiration.*—Mrs. O. B., cook by occupation, has been deaf in the left ear for six or seven years. The loss of hearing, or rather the great singing in the ear that preceded it, was rather sudden in its origin, and is ascribed by her to getting cold while lying down when overheated and scantily clothed. The hearing distance of the right ear is $\frac{2}{4}$; left ear, $\frac{0}{4}$. The right membrana tympani is normal in appearance. The left is sunken and has two light spots. The tuning-fork is only heard in the right ear.

CASE XIII. *Sudden tinnitus aurium; deafness; excessive use of tobacco.*—Mr. R., æt. 57, upholsterer. Eighteen months ago the patient was suddenly seized with tinnitus aurium of the right side. This noise has continued ever since. His general health is good, except that he has periodical headache; he smokes a dozen pipes a day; he has never had pain in the ear. Hearing distance, watch laid on the right ear; left ear, $\frac{7}{8}$. The drumheads seem to be normal in appearance; the tuning-fork is heard more distinctly in the better ear. Inflation of the ears improves the hearing on the left side, but it makes no change on the right.

CASE XIV. *Suddenly occurring deafness in one ear; three years later sudden deafness of the other.*—Aug. 31, 1869. Mrs. A., æt. 47, healthy-looking, states that three years ago, on the 2d of August, she retired with her hearing apparently in its usual healthy condition, but awoke deaf in one ear, with a roaring sound in it. Five weeks ago, while riding in the railway cars, a noise occurred in the other ear, and she is now deaf to all ordinary sounds; the noise, however, has disappeared; the vibrations of the tuning-fork are not perceived. The general health of the patient is good, and no cause for the deafness was found in the history, or in any examination that was made. The bowels have been constipated for years. There is no dizziness.

CASE XV. *Sudden deafness with tinnitus aurium.*—Nov. 3, 1873. Dr. R. M. D., æt. 60, nearly three years ago, while attending a midwifery case, perceived suddenly a whistling sound in his left ear, which has continued ever since, and there is some impairment of hearing on that side.

Hearing distance: right normal; left $\frac{2}{4} \frac{0}{8}$. The tuning-fork is heard better in the right ear. The drumheads show no traces of disease, and the tympanic cavities are readily inflated. The ear has been treated for middle ear trouble without alleviation.

CASE XVI. *Cerebral hemorrhage; deafness.*—Mr. B., æt. 62, a rather feeble man, with intellect seemingly unimpaired, had an attack that appears to have been one of cerebral hemorrhage, and is partially paralyzed on the right side. Since then he has been hard of hearing in the left ear; and, although he has very much improved as to his paralysis, he is very often dizzy, and walks with some unsteadiness. His hearing power is nearly obliterated on the left side; on the right it is $\frac{1}{4} \frac{2}{8}$. He hears the tuning-fork only on the right side. There are no marked appearances on the drumheads, and the tympanic cavities are easily inflated, without benefit to the hearing.

CASE XVII. *Sudden deafness of one side; gradual loss of hearing on the other.*—J. T. A., æt. 47, fifteen or eighteen years ago lost the hearing of one ear almost instantly, without known cause. He is now gradually losing the hearing power in the left ear. Hearing distance: right ear 0; left $\frac{2}{4} \frac{2}{8}$. Conversation is heard better than the watch would indicate.

CASE XVIII. *Sudden loss of hearing of one side, ascribed to excessive mental employment.*—April, 1873. Dr. J., æt. 33, eleven years ago, just before graduating in medicine, was lying upon a lounge studying, and on getting up found a ringing in the left ear, accompanied by dizziness, so that he staggered about the room for some time. He soon recovered from the vertigo, but experienced some impairment of hearing in the left ear, and this has continued, with rather more intensity than at first. Hearing distance: right ear $\frac{4}{6} \frac{2}{0}$; left $\frac{1}{5} \frac{1}{0}$. Tuning-fork is only heard on the right side. The ear is very sensitive to cold. A moderate amount of cold causes cold; overwork also increases the tinnitus. The patient is now a hard-working physician, and is at times compelled to give up work for a time on account of the troublesome symptoms referred to his ear.

Inflammatory affections.—In discussing the subject of the inflammatory origin of nerve deafness, we enter not only upon a wide field, but upon a theme that has caused much difference of opinion. Yet there is a common ground from which we may start. Inflammation of the labyrinth may extend from the base of the brain in the course of the various affections that exist there. Thus, in basilar meningitis, there may be an effusion about the auditory as well as the facial nerve, and the patient become deaf as well as suffering from loss of motion. Syphilis may produce a perioritis of the internal auditory canal; or a gummy tumour may occur in the semicircular canals. The morbid process known as cerebro-spinal meningitis, after it attacks the membranes of the brain, may extend to the internal as well as to the middle ear.

But there are several questions which naturally suggest themselves to us. For instance:—

May we have a spontaneous, independent inflammation of the nerve expansion in the cochlea and semicircular canals, which only affects the cerebrum in a reflex manner, just as convulsions may be caused by the pressure of pus or mucus in the tympanic cavity?

Does quinia, when taken internally, sometimes produce an inflammation of the auditory expansion?

These latter are questions still *sub judice*. I must, however, confess my earnest conviction that there is such a thing as primary affection of the labyrinth, especially in young children; and that it is sometimes mistaken for cerebro-spinal or basilar meningitis.

As to the effects of quinia I am only positive on one point; and that is, that large doses of quinia will aggravate a previously-existing aural inflammation, and place it beyond the possibility of cure. The tinnitus aurium resulting from the large doses of the remedy must be due to a congestion of the ultimate fibres of the nerve. That congestion usually disappears entirely, but perhaps not always—certainly not in every case when there is a pre-existing congestion of the auditory apparatus. Quinia, therefore, becomes a doubtful remedy in cases of acute basilar or cerebro-spinal meningitis, or in cases of acute affections of the tympanic cavity.

Dr. C. S. Duffy, Jr., of Newbern, N. C., has collected for me the few following cases of impairment of hearing, supposed to have been aggravated or caused by quinia; but both Dr. Duffy and myself admit that the evidence that the use of the medical agent is of itself sufficient to produce disease of the internal or middle ear is not perfectly conclusive.

"It is almost certain," Dr. D. writes me, "that two of the following cases, though they claim to have been rendered deaf by quinia (Cases 1 and 3), owe their trouble to other causes. No. 2 looks like a veritable case of quinia difficulty, and yet I believe, could I have used the catheter a few times, the hearing could have been greatly improved. I have treated this lady recently in a malarial attack, and given her quinia (20 grains daily) for several days, administering at the same time morphia and bromide of potash, without much inconvenience to her.

"In future I will keep a sharp look-out for these cases, and if I find anything worth sending you will make a note of it.

"CASE 1. April 3d, Mrs. Z. C., aged 46, pale and sallow, thin and emaciated; when a child was much troubled with earache which was usually succeeded by discharge from auditory canal. Had slight dulness of hearing ever since, up to the age of thirteen, when, after having taken moderate doses of quinia for some months with but slight inconvenience, took a very large dose (do not know how much) and became suddenly deaf. Had tinnitus constantly, and very annoying—the noise "sometimes resembling that of a wagon running over a rocky road," but always aggravated by quinia. Cannot hear the watch pressed on either side. Hears ordinary conversational pitch through trumpet but requires to be spoken to very loudly to be made to understand without it. Hears tuning-fork on either side strike. Drumhead pinkish, transparent, but much shrunken; handle of malleus and short process distinctly seen. Could not inflate drum, or improve the hearing by the attempt. Throat relaxed and flabby, with distended vessels. No enlargement of the tonsils.

"CASE 2. April 6, 1874, Miss A. V. D. Very healthy; hearing perfect, until attacked with chills twenty years ago; the second paroxysm occurred, notwithstanding quinia had been freely administered, and was of such severity as to seriously threaten life. Large doses of quinia frequently repeated (quantity not known) during the succeeding twenty-four hours were given, and continued in gradually diminishing doses for ten days, at which time convalescence was established. Hearing almost wholly extinct; tinnitus, with loud, explosive sounds, was troublesome. After three or four years hearing had improved, when another attack again necessitating the administration of the previously

described remedies, she was again reduced to a similar condition, which has continued to the present time. Hearing distance; right, $\frac{1}{2}$ inch; left pressed. Tuning fork best "in left." Drumheads shrunken, malleus distinct on either side. After Politzerizing, hearing distance increased on right to $1\frac{1}{2}$ inches, left to $\frac{1}{2}$ inch. The patient not cognizant of air having entered cavity; would not tolerate catheter; throat injected; uvula relaxed; tonsils enlarged and nodulated; hoarseness, with disposition frequently to clear the throat.

"CASE 3. April 11, 1874, G. B., aged 13. Had measles when four years old, which left some difficulty of hearing on the left side. When six years old had typhoid fever (so his mother says) which lasted ten days (?). Had severe pain in his head, and was delirious; took "a great deal of quinia," which "made his head so bad it had to be discontinued." When he had recovered from fever it was found he could hardly hear the loudest noise—not even thunder. No tinnitus. Cannot make him hear anything at all. Can feel the tuning-fork but not hear it. Drumheads whitish, and so much depressed as to seem to be drawn tightly over the bones; short process projects much like a thorn; no air can be made to enter cavity with Politzer or catheter. Throat scarred. Tonsils hard and nodular."

Parotitis.—Two of my cases of disease of the internal ear were probably caused by parotitis, and their histories are here given.

CASE XIX. *Parotitis; deafness of one side*.—H. A. H., æt. 23; three years since the patient had the mumps, not severely, but in it he lost the hearing of the right ear. Hearing distance: right $\frac{0}{48}$; left $\frac{48}{48}$. The membrana tympani is entirely normal in appearance. The watch is heard when pressed upon the mastoid process. There is considerable tinnitus aurium. The patient was treated for about two months by applications through the Eustachian tube. After the first application the watch was heard when pressed upon the auricle, but the hearing power never got beyond that. The tinnitus aurium was diminished for an hour or so after the application of vapour to the middle ear.

CASE XX. *Parotitis; deafness of one side*.—Miss B., æt. 21: A year since, had the mumps, and on recovery she discovered that there was a buzzing sound, like that of insects in the left ear; from that period until the present time the hearing-power has been very defective from that ear. Hearing distance, right ear 0; left ear, normal. The tuning-fork is heard only on the right side of the head. The membranæ tympani are normal in appearance. There is granular pharyngitis.

Parotitis is decidedly a catarrhal disease, and probably of the ducts of the parotid. It is not at all unlikely that oral catarrh is present in all the cases; and the catarrh of the pharynx may lead to that of the tube and the tympanic cavity. In severe cases of parotitis, although this is very rarely true of the idiopathic parotitis, but more frequently in the form arising in the course of other diseases, periostitis of the malar, maxillary, temporal, and sphenoidal bones, may occur; and thus the tympanic cavity and labyrinth be affected. The etiology of primary or secondary affections of the labyrinth, occurring during the course of parotitis, seems to me to be quite clear. There is simply an extension of a catarrh of the mouth to the Eustachian tube and tympanic cavities, and to the vestibule, semicircular canals or cochlea, or there may be an extension of a periostitis, or suppurative process.

Extension of cerebro-meningeal disease.—Seven of the cases here re-

ported resulted undoubtedly from an extension of the inflammatory process in the case of the brain to the internal or middle ear. I say internal *or* middle, for reasons that will soon be given, which do not make me certain that the lesion was in the internal ear.

All the writers upon general medicine that I have been able to consult and my own experience agree that as a consequence of cerebro-spinal meningitis different parts of the eyeball may become affected; so that we may have purulent conjunctivitis, keratitis, choroiditis, serous or purulent, as well as optic neuritis, as effects of this disease. Eyes may be readily examined, hence there is no dispute as to the kind of ocular lesion that may occur as a result of cerebro-spinal meningitis. The ear may also be affected in all its parts in the course of cerebro-spinal meningitis. I have seen otitis media catarrhalis and suppurativa occurring as a result of this disease. It is not correct, in my opinion, to state that we can make a diagnosis as to the seat of aural trouble by the amount of the impairment of the hearing. I have seen persons so hard of hearing, from disease which certainly was chiefly situated in the middle ear, that no conversation could be had, even if words were spoken into the auditory canals; and, on the other hand, there may be considerable primary impairment of the functions of the terminal auditory apparatus, and yet the deafness not be absolute. As well might we say that a diagnosis between an affection of the media and the light-perceiving surfaces of the eye can be made by an estimation of the degree of vision, as to conclude that, because the impairment of hearing is nearly absolute, the seat of the primary and chief lesion is the auditory nerve. A thoroughly sunken drumhead, a rigid chain of ossicula, and a tympanic cavity well plugged with neoplastic material, will make any but the faintest perception of sound impossible. It will be observed that in nearly all the cases of deafness that I have seen in adults, there was still some perception of sound; and it is extremely rare to find patients, even in deaf and dumb asylums, in whom quantitative perception of sound is obliterated.

Three post-mortems which have been often quoted have demonstrated suppuration of the labyrinth as the lesion in disease of the ear attendant on cerebro-spinal meningitis; but the assertion which is creeping into our literature as a fact,¹ that suppuration of the labyrinth is *the* lesion of the ear, has no better foundation than these meagre facts, and an argument by analogy from the state of things that occurs in the eye. Moos has very lately reported the post-mortem of a case which confirms the view that I advanced, at a meeting of the New York Ophthalmological Society, some three years since, viz., that non-suppurative middle ear disease might be the cause of the deafness arising from cerebro-spinal meningitis. In Moos's

¹ Dr. J. Lewis Smith, American Journal of the Medical Sciences, October, 1873, p. 332.

case, not a trace of nerve-disease was found except hyperæmia of the sheath of both auditory nerves, but the inflammation made its way along the dura mater into both tympanic cavities. The mucous membrane of the middle ear was "very vascular, hyperæmic, and thickened." There was some serous fluid at the bottom of the tympanic cavity. Moos also quotes a case from Klebs, that of an officer who died from cerebro-spinal meningitis, where the auditory nerves showed nothing abnormal, and the terminal apparatus of the nerve showed no lesion to explain the deafness. But, in the tympanic cavity were found the remains of a very extensive inflammatory process in the form of numerous, dark, vascular bands of connective tissue which radiated from the vesicle to all parts of the tympanic cavity.¹ I am, therefore, in doubt whether some of the cases which, in accordance with the prevailing nomenclature, I have classified under the head of nervous deafness from cerebro-spinal meningitis, do not rather belong to that of middle ear disease, especially as my clinical observations constantly show me cases of loss of hearing after or in the course of this disease, that give all the appearances, in a sunken and rigid drumhead, sufficient to account for the loss of hearing. The hypothesis that the lesion of the ear is a suppuration is certainly as yet confirmed by no evidence that renders it anything more than an hypothesis. There are more post-mortems on record where the lesion is not in the internal ear at all, than there are of suppuration of the labyrinth; and, in the post-mortem investigations of the internal ear made by Toynbee, Hinton, Moos, and von Trötsch, this lesion has as yet been observed but twice.

CASE XXI. Cerebro-spinal meningitis; bi-lateral deafness; both drumheads sunken.—Dec. 30, 1869, R. M. W., æt. 13, five years ago this winter, had an inflammatory disease of the head and joints, and, when he recovered from this affection, became deaf. He does not hear words in any way. He feels the tuning-fork in each ear. The membranæ tympani of both sides are sunken; the pharynx and nares are in a healthy condition; air enters both tympanic cavities.

CASE XXII. Cerebro-spinal meningitis; deafness of both sides.—A. B., æt. 5, when fifteen months old, imitated speech and other sounds; and, at about this period of its life, it went to bed apparently well one evening, but awoke in the morning with a severe attack of vomiting, and for 24 hours had convulsive movements. There were purple spots on the legs and arms. Recovery occurred in two or three months. The patient seemed to be conscious of sounds during its illness, sounds disturbed him. He was soon discovered to be deaf.

CASE XXIII. Cerebro-spinal meningitis; absolute deafness; both drumheads sunken.—C. M., boy, æt. 4 years 8 months, heard and talked well until about a year ago, until he had a fit of sickness, which the parents described very imperfectly, but which was attended by some loss of power in the limbs. There was at one time some discharge of pus from one of the ears. The child does not seem to hear sounds at all; the vibrations of a large tuning-fork are not perceived. Both drumheads sunken and pinkish.

¹ Knapp and Moos's Archives of Ophthalmology and Otology, vol. iii. No. 2.

CASE XXIV. *Cerebro-spinal meningitis; deafness absolute; membranæ tympani normal.*—May 22, 1872, D. W. K., æt. 21, a little more than three months since was attacked by some disease of the head, and for two weeks was stupid or delirious. There were some little spots on the neck. When he became conscious, he could not hear; he has remained deaf ever since. There seems to be absolutely no hearing power; cannot hear the voice even when conveyed to the ear through a tube; and is equally insusceptible of the sound of the tuning-fork or the piano. The membranæ tympani are of normal colour, transparency, and position; air enters the tympanic cavities.

CASE XXV. *Cerebro-spinal meningitis; sunken drumheads.*—Geo. S., æt. 25 months, when 14 months old had congestion of the brain, was unconscious, paralyzed, and had spots on the skin. Was found to be deaf when he recovered. Both membranæ tympani are sunken.

CASE XXVI. *Cerebro-spinal meningitis; sunken drumheads.*—May 31, 1873, John D., æt. 9, eight weeks ago to-day was seized with a pain in his head at about 8 o'clock A. M. The pain was said to be across the forehead. At 11 o'clock he had convulsions. There was spasm, especially of the hands and throat, at 8 P. M.; complained of headache; and at 11 P. M. he vomited. He became unconscious, and remained so until 4 A. M. Ten days after the attacks he was deaf, and still continues to be so. He states that there is a whistling sound in his ears. He took large doses of quinia, and soon recovered from all the symptoms, except a little uncertainty in his steps, and even now he has a somewhat tottering gait. He does not hear the watch at all; but can distinguish sounds conducted into his ear through a tube. The tuning-fork, when placed upon the teeth, produces a buzzing noise. The drum membranes are very much sunken, and of a pinkish hue; shows a small light spot.

CASE XXVII. *Cerebro-spinal meningitis; normal membranæ tympani; slight amount of hearing power as tested by piano.*—March 17, 1874, D. B., æt. 21, a little more than ten months ago was attacked with a chill, which was attributed to sitting upon a stone in the front of the house during the month of May. After the chill the patient became delirious, and his neck was stiff, and he had no use in his arms or legs. This state of things continued for one week. As soon as he became rational he was found to be deaf, and his left side remained paralyzed. He gradually recovered from the paralysis, though his deafness continues, and he staggers in his walk. Hearing distance: right 0, left 0. The tuning-fork is faintly heard in both ears; he is sensible to the tones of his own voice, and talks in a natural tone, modulating fairly. He thinks his right ear is the better one. By means of a conversation tube connected with the keys of a piano, he is enabled, through the medium of the right ear, to distinguish the C, D, and E of the treble, as well as all the bass notes. With the left ear he cannot distinguish the treble, the bass notes alone being audible. This is in accordance with the law of acoustics, that the impression of the bass or low notes remains longer on the ear, thus proving that the patient had still a slight trace of hearing power remaining in the cochlea, and that the statement that he heard better with the right ear was correct. The membranæ tympani are transparent, the pharynx is granular. The patient has been for some weeks under competent treatment, but without perceptible benefit.

CASE XXVIII. *Cerebro-spinal meningitis; normal membranæ tympani.*—May 2, 1872, Virgil T., æt. 5, four weeks ago was seized with a

severe pain in the head; soon vomited, and was delirious at times, especially on waking from sleep. He complains of pain in the back and neck, and also of pain in his right ear. Four days after the attack began he was found to be deaf, which was increased after a second attack of pain. Apparently there is an entire absence of hearing power. There is nothing marked in the appearance of the drum membranes. He totters in his gait.

Basilar meningitis, typhoid fever, scarlet fever, and measles are known to cause disease of the ear. The first-named disease usually affects the internal ear by direct extension of the inflammatory process from the base of the brain. In typhoid fever, however, the primary development, whatever the secondary affection may prove to be, exhibits itself in the middle ear, from "a propagation of the oral and pharyngeal catarrh to the Eustachian tube and cavity of the tympanum."¹ There may, however, be an extension of meningeal inflammation to the labyrinth. Almost the same may be remarked of scarlatina and measles. It is well known that the affection ordinarily resulting from those two diseases is suppuration of the middle ear. Of the various cases that have come under my notice, eight may be said to be distinctly traceable to one of the above-mentioned causes. Others that I have seen lead me to believe that an acute inflammation of the tympanic cavity may soon, without suppuration, pass to the labyrinth.

CASE XXIX. *Scarlet fever; deafness; no changes in the pharynx or outer ear.*—Jan. 28, 1870, S. M. J., æt. 5, had a mild attack of scarlet fever when he was eight months old; the mother discovered that the child was deaf four months afterwards. There would appear to be no hearing power. The tuning-fork causes no sensation. The pharynx and nares are in a healthy state, and the membranæ tympani show no changes.

CASE XXX. *Convulsions; deafness.*—Boy of six years of age. August 13, 1869. Two years ago he had convulsions which lasted for two or three days. After he recovered he was found to be deaf, and still continues in that state. Drumheads sunken on both sides. Appears to be totally deaf.

CASE XXXI. *Measles; no marked change in drumhead; deafness.*—Miss P., æt. 16, when seven or eight years old had measles, and about six or eight months afterwards became deaf in the right ear. Hearing distance: right 0, left $\frac{20}{48}$. She does not hear the tuning-fork from the right side, but can distinguish the sound of a voice conveyed to the drumhead through a tube. The membranæ tympani are normal, except that the light spot is dull.

CASE XXXII. *Hydrocephalus; deafness.*—Sept. 7, 1870, Carrie X., æt. 4, in June of this year had, according to the family physician, acute hydrocephalus; and when she recovered from it, was found to be deaf, and still continues so. There are no evidences of disease in the membranæ tympani or pharynx.

CASE XXXIII. *Meningitis; gradual deafness.*—June 25, 1870, W. K. J., æt. 27, complains of increased impairment of hearing. Had scarlet fever when a child, after which he felt a diminution in the hearing power. Last winter had congestion of the brain and hemiplegia of left side. His

¹ Niemeyer, Hackley and Humphrey's translation, vol. ii. p. 584.

right ear became decidedly worse at this time. He has recovered from the hemiplegia. There is no tinnitus aurium. The hearing distance on the right side 0, left $1\frac{2}{3}$. Tuning-fork is heard better on right side. The right membrana tympani is sunken, and has no light spot. The left is also sunken, and exhibits two reflections of light. Inflation of the ears improves the hearing on the left side.

CASE XXXIV. *Basilar meningitis; bilateral deafness.*—April 30, 1872, William R., æt. 27, says that seven weeks ago he could hear well, but after an attack of fever attended by delirium, he found, when restored to consciousness, that he had lost his hearing. There is a roaring noise in the left ear, but no other aural symptom. He can hear the watch when laid upon the right ear, but not at all upon the left. The tuning-fork is also heard more or less distinctly in the right ear. The right drumhead is somewhat sunken, the left very much so.

CASE XXXV. *Meningitis; inflammation of cerebral meninges and labyrinth; exposure to direct rays of sun.*—Sept. 8, 1873, Laura —, æt. 22 mos. The mother states that when the child was eight months old, and teething, she was unduly exposed to the direct rays of the sun, and was thereupon suddenly attacked with convulsions and was ill for three weeks afterward. The physician in charge observed that she was losing her hearing, and the mother thinks that she has not heard since that period. The drumheads are both very much sunken and have no light spot.

CASE XXXVI. *Basilar meningitis; effusion about auditory nerve; intermittent character of attacks; epilepsy; deafness; recovery.*—Jan. 29, 1874, Moses B., æt. 29, merchant, previous to July last heard perfectly well. He has had intermittent fever at different times for two years; had also an attack of sunstroke. In July he lost the hearing in one ear, and for four weeks he was deaf with both ears. After a course of counter-irritation his hearing gradually returned. He has taken a large quantity of quinia. Some weeks ago, while at Petersburg, Va., his hearing power again failed, and at the present time he cannot hear words at all; even the ticking of the watch is not perceived. He cannot hear the tuning-fork when placed upon the head, but feels it when on the teeth. The drumheads are somewhat opaque, and there is granular pharyngitis. He complains of a severe pain in the top of his head, and of a knocking sound in the interior. His countenance is very anxious, appetite poor, but he walks well. There is no history of syphilis. He had a severe fall upon his head, striking the occipital region, when he was seven years of age. I saw the patient first at my clinique at the University Medical College, and the next day at my office in consultation with his family physician. I did not see him again for two months, when, at the instance of Dr. Wm. A. Hammond, he called upon me, and to my great delight I found that he could now hear conversation with ease, and the watch at twenty inches; hearing distance $\frac{2}{3}$ on each side. He had been under Dr. Hammond's care for about four weeks.

Dr. Hammond treated the case by means of the iodide of potassium mixed with the bromide. This treatment relieved the cephalalgia and epilepsy. Subsequently he administered arsenic in consequence of the intermittent type of the epilepsy. The hearing power was suddenly restored on one side, and the other soon became better also.

Through the kind courtesy of Dr. H. G. Miller, of Providence, I have

been furnished with the following interesting history, and I was also afforded the opportunity of seeing the case :—

CASE XXXVII. *Meningitis; inflammation of both auditory nerves; recovery of one.*—December 29, 1873, H. S., a student of Trinity College, early in October, had an acute affection of the cerebral meninges and of internal ear, leaving him totally deaf in one ear, and nearly so in the other. I saw him first about ten days after the commencement of the trouble. His condition then was: External and middle ears perfectly normal; subjective noises very troublesome, and extreme giddiness on walking, and especially on attempting to go down stairs, and also in turning the head in either direction. Hearing distance: right ear, contact for a watch of 30'; left ear, 0. Tuning-fork heard by conduction in right, not at all in left. I put him on bromide and iodide of potassium, and soon began the use of the constant current. The right ear improved rapidly, and in about five weeks hearing distance became normal. For some time after that, however, through the two octaves of the piano, from middle C upwards, he heard, in addition to the note struck, another less than a semitone above, which produced a most disagreeable clang, and rendered music very unpleasant to him. I then saw Dr. Blake, in consultation, about the left ear. He found in it perception for higher sounds than normal, and that this perception was prolonged by the continued current; and advised the continuance of the electricity, and also the use of valerianate of zinc and conium. Since that time there has been but little change. He has at times heard the watch faintly, but cannot always be sure of it. The auricle of the affected ear was quite numb. No further treatment was advised.

CASE XXXVIII. *Scarlatina; measles; mumps; deafness.*—September 15, 1873, H. N. G., æt. 34, when two or three years old, is said to have had scarlet fever, and again at eleven years of age. He also had the measles and mumps in that same year. He never had any discharge from his ears, and but rarely any tinnitus. He did not hear the watch at all on the right side, and thought he heard it slightly when pressed on the left; but was not certain. The tuning-fork is heard more distinctly on the left side. The right drumhead is sunken, but the left one is normal. Air enters both tympanic cavities without difficulty.

CASE XXXIX. *Meningitis; deafness; normal membranæ tympani.*—Sallie A., æt. 13, three months ago was attacked with severe headache and vomiting; delirium at times, but generally consciousness retained. In three weeks the fever subsided. There was no paralysis. She did not hear well after being ill a few days. Was attacked on Saturday, and on Wednesday it was observed that she did not hear words, even when spoken very close to her. The patient complained then, as now, of severe tinnitus aurium; does not hear the watch at all. The tuning-fork is heard well and naturally. Jarring sounds hurt her head. There are no marked changes on the membrana tympani.

Primary Lesion of the Labyrinth.—Seven cases supposed, from various reasons given in the histories, to be affections of the labyrinth, arising primarily in the internal ear :—

CASE XL. *Stupor; deafness; use of quinia.*—Gertrude S., æt. 27 months, five months ago passed suddenly into a state of stupor; was very pale, and each day had severe fever. The treatment consisted chiefly,

according to the statement of the mother, in the administration of quinia. The little patient does not seem to have any hearing power. The drumheads look well; both have good light spots.

CASE XLI. *Primary labyrinth disease*.—March 25, 1872, Martha —, æt. 11, when sixteen months old, had some kind of convulsions, and since has been deaf. Had spoken words and given other evidence of hearing before this. She never had any disease of the head, nor discharge from the ear. She cannot now hear the ticking of a watch, nor words spoken into the ear; but the vibrations of a tuning-fork are plainly perceived. Both membranæ tympani are sunken.

CASE XLII. *Inflammation of labyrinth from cold induced by lying down while in a state of perspiration*.—June 9, 1873, Geo. O'B., æt. 31, agent, one day last summer lay down while in a state of profuse perspiration. The next day he observed a singing noise in his right ear, and that then he did not hear well on that side. There were also darting pains across his head and the back of the auricle; is anxious and worried; states that he had an acute inflammation of the head some time since. Hearing distance: right ear, 0; left, $\frac{4}{8}$. The membranæ tympani show no signs of disease. The tuning-fork is heard most distinctly on the left side.

CASE XLIII. *Exposure to draft of air, loss of substance on one side of face; deafness*.—July 11, 1870, A. D. B., æt. 58, taxidermist, two years ago, while riding in a railway carriage, fell asleep, while a window was open near his head, and when he awoke he found that his face was numb and he was deaf. This deafness continues. There is some impairment of hearing on the other side from a chronic ear trouble, but the tuning-fork is heard only on that side. The patient has been a great sportsman, and has often been temporarily deaf from severe concussion. The watch is not heard at all on the right side, and $\frac{6}{8}$ on left.

CASE XLIV. *Nervous deafness, perhaps secondary to tympanic catarrh*.—Miss O. had the measles when a small child, which left her hearing somewhat impaired. What hearing power remained was lost in one night some months since. She cannot hear the watch, tuning-fork, or speech—in fact she is totally deaf. The drumheads are sunken; the pharynx is in a catarrhal condition. She has been thoroughly treated by a competent physician, but without effect.

CASE XLV. *Convulsions; pain in ears; deafness; normal membranæ tympani*.—Z. A. H., æt. 6, when eight months old, had spasms until the age of 13 months, sometimes having fifteen or twenty fits a day. After the convulsions had continued for four or five days, he was discovered to be deaf. The mother is certain that he could hear well before this time. During his illness he would at times put his hands to his ears. The recollection of the mother is not distinct as to whether there was any gathering in the ears, but she is inclined to think there was. The child seems to have no hearing power. Both membranæ tympani are normal in colour and position. The tonsils are large.

CASE XLVI. *Pain; paralysis; deafness*.—Maria L., æt. 3, when two years and a month old, awoke one night screaming with pain. She did not roll her head, or become unconscious, but lost power over her limbs, and had general febrile excitement. She was ill for one week, but it was two months before she could walk. On recovery, she was found to be deaf, and is now almost if not entirely devoid of hearing. The membranæ tympani of each side altered in curvature and colour.

Quinia.—I do not as yet lay much stress upon the power of quinia to produce impairment of hearing. I append the cases, however, in which the influence of this drug seems to have been felt in producing nerve deafness.

CASE XLVII. *Bilious fever; administration of quinia*.—J. F., æt. 28, artist, when fourteen years old had "bilious fever," and at that time he took a large quantity of quinia. Immediately after there was some impairment of the hearing power; and of late years tinnitus aurium has been very troublesome, and the hearing power is constantly lessening. The hearing distance, right ear, $\frac{0}{48}$; left ear, $\frac{1}{8}$. Tuning-fork heard more distinctly in the *left ear*. The right membrana tympani is very opaque, and has no light spot, but it moves on the Valsalvian experiment. Pharynx granular. The patient has been for some time under the care of a competent medical adviser, and has not improved.

CASE XLVIII. *Intermittent fever; administration of quinia; persistent tinnitus aurium; impairment of hearing; tuning-fork heard in healthy ear*.—M. K., æt. 35, nine or ten years since had intermittent fever, and took quinia in large doses. There was a persistent rumbling sound in the right ear when he recovered. He did not observe that there was any impairment of hearing until some weeks after, when he found the hearing power on that side gradually diminishing. At the present time he can hear the watch on the right ear only when closely pressed to it. The hearing distance of the left ear is normal. The tuning-fork is not heard at all on the right ear. The patient is a highly educated man, and a good observer.

CASE XLIX. *Fever; administration of quinia; complete deafness of one ear*.—Nov. 7, 1867, J. G., æt. 30, in 1862 suffered from sore throat and fever, while in the United States service on the Chickahominy; took quinia quite freely; and subsequently became perfectly deaf, so much so as to be pronounced unfit for duty. He eventually recovered his hearing on the left side. On submitting to the watch test, there appeared to be no hearing power in the right ear, though he could hear words on that side when conveyed through a speaking tube. There was no vertigo or other unpleasant head symptoms. The record is deficient as to the appearance of the drumheads. Inflation of the ear by the catheter and Politzer's method produced no perceptible effect on the hearing power. The tuning-fork was not employed in the diagnosis.

CASE L. *Intermittent fever; deafness; quinia administered*.—Willie R., æt. 3, five weeks ago had an intermittent fever, which was at first regular in character, but soon ceased to bear that aspect. Two weeks after the commencement of the fever, he lost his hearing power; and now, after careful investigation and testing, the conclusion is reached that he cannot hear at all. The membranæ tympani exhibit no change. He took quinia for the relief of the fever for one week; but how much, or in what quantities, is not known by the parents.

In thirteen cases the history was so defective—in one or two instances, from neglect on my own part to record the facts fully; in the others, however, from inability to obtain them—that no judgment can be formed as to the causes of the loss of hearing.

The following sad case is placed among affections of the internal ear from causes unknown, for reasons that the history will give. An exami-

nation of the temporal bone would have added very materially to our knowledge of the case. It is possible that the tinnitus and the head symptoms were caused by a cerebral inflammation which finally became an abscess.

CASE LI. *Tinnitus aurium for years; death from malignant pustule; cerebral abscess; cause unknown.*—Dec. 9, 1867, P. W., æt. 29, consulted me in regard to a distressing tinnitus aurium affecting the left side of the head only. This case has been alluded to by me in another place,¹ but it is of such interest, and throws such light upon the phenomenon of noise in the ear, that it may be worthy of more complete mention. The patient was very much depressed on account of the tinnitus aurium, which began a year before he consulted me. Indeed, he was almost melancholic, and at last gave up his business because his head troubled him so much; and in consequence of the persistent noise in it, he did not feel able to continue in any occupation requiring much use of his mental powers. The hearing distance in the right ear was normal; in the left it was $\frac{3}{4}$ s. The right drumhead was normal; the left was sunken and opaque. The action of the Eustachian tubes was sluggish, so that it was some time before air could be forced through them. This was finally successful by Politzer's method, when the hearing distance was improved to $\frac{5}{4}$ s. The patient remained under my observation and occasional treatment for a year or more; and his hearing improved so much that it became at one time $\frac{1\frac{1}{2}}{4}$ s; but the tinnitus aurium was never essentially modified or diminished, and the patient became more and more gloomy. He died of malignant pustule Sept. 15, 1869. A post-mortem examination was made by George A. Sterling, M.D., of Sag Harbor. There was found to be great injection of the pia mater over the petrous portion of the temporal bone; and an abscess about the size of a ten-cent piece in the brain substance. It was bound by inflammatory adhesions, and contained about ten drops of pus. It was situated on the superior lobe of the left side, an inch from the median line and two inches from the line of the coronal suture.

CASE LII. Miss P., æt 15; two years ago, without known cause, began to be deaf in the right ear; thinks the deafness came on gradually, but is not positive that it was not lost suddenly. Hearing distance: right, $\frac{0}{4}$ s; left, $\frac{4\frac{8}{8}}{4}$ s. There is some pharyngitis; air enters both tympanic cavities. The tuning-fork is not heard at all on the side of the affected ear.

CASE LIII. G. Y., æt. 50, merchant; six months ago, rather suddenly observed deafness in the left ear, accompanied by a ringing noise. Hearing distance: right ear, normal; left, $\frac{0}{4}$ s. The tuning-fork is only heard in the right ear. After the tympanic cavities are inflated, the watch is heard when pressed upon the left ear.

CASE LIV. Boy, æt. 4; has not heard since birth; has always been well, and is now a robust child. No abnormal appearances in drumhead or pharynx. Does not seem to hear at all.

CASE LV. V. U., æt. 21; rather feeble; has congenital cataract. The hearing of the left ear suddenly failed three years since. He has nasopharyngeal inflammation. Hearing distance: right ear, normal. Watch pressed; the tuning-fork is not heard on the left side. The drumhead appears to be normal.

CASE LVI. Fauny C., æt. 3; had congestion of the lungs when three

¹ Roosa, *Treatise on the Ear*, p. 446.

months old, and has not heard since. The father and mother are first cousins. The drumheads appear to be normal, and the child seems to have no hearing power. She is well developed.

CASE LVII. *Æt.* 6; two or three years ago was accidentally observed to have lost the hearing power on the right side. Even words spoken into the ear through a tube were not heard. The membrana tympani was normal, except that the light spot was small. The hearing power was perfect on the left side. No cause for the loss of hearing could be given by the parents or family physician. The child was in fair health. The ears were inflated, but no effect upon the hearing power was produced.

CASE LVIII. Mr. P., *æt.* 46; two years ago, without any apparent cause therefor, experienced a diminution of hearing power. At times he had a ringing noise in the ears. Hearing distance: right, $\frac{0}{48}$; left, $\frac{6}{48}$. The tuning-fork is only heard on the left side. The drumheads are sunken. There is hypersecretion of the pharynx; had primary syphilis since the ear trouble began, and now has secondary symptoms.

CASE LIX. March 20, 1873, M. A. C., *æt.* 19, clerk, states he had scarlet fever nine months ago. There was no eruption, however, but his physician declares that to be the disease from which he suffered. When he recovered he experienced a "buzzing" in his right ear, and that he could not hear on that side, nor could he hear the ticking of the watch at all in the right ear. Hearing distance: left $\frac{48}{48}$. Both membranæ tympani have small and irregular light spots, and are somewhat sunken. The uvula is long and flaccid, and there is some pharyngitis.

CASE LX. July 2, 1873, Miss B., *æt.* 20, some years ago observed she could not hear from the left ear. There was no tinnitus—no discharge. Hearing distance: right $\frac{48}{48}$, left $\frac{0}{48}$. Cannot hear words, even through a tube. Hears the tuning-fork only on the right side.

CASE LXI. Sept. 29, 1873, Wm. L., *æt.* 16, states that he has been deaf in the left ear ever since he can remember; hears perfectly with the other; knows no cause, although there is a tradition in the family that the affection came from scarlet fever. Hearing distance: right normal, left $\frac{0}{48}$. The tuning-fork is heard only on the right side. The drumhead is normal.

CASE LXII. *History too defective for use, but diagnosis of nerve deafness made.*

CASE LXIII. Nov. 6, 1873, Mr. G., *æt.* 36, states he has had a buzzing and ringing sound in the left ear for thirteen months, and his hearing has become impaired on that side. Hearing distance: right normal; left, watch pressed on the ear. The tuning-fork is heard better on the right side. The left drumhead is very much sunken, and has no light spot. Air enters both tympanic cavities. The patient has had syphilis, but he gives no evidence of the disease now.

CASE LXIV.—Miss G., *æt.* 33, twenty years ago had scarlet fever, and since has not heard with the left ear. There is no tinnitus in it—no discharge. At times she cannot hear with the right ear when she has a cold in the head. Hearing distance: right normal; left 0. The tuning-fork is heard more distinctly in the right ear. She hears words through a tube placed in the left meatus. The pharynx is granular. Both membranæ tympani are sunken. Air enters right tympanic cavity freely, not so the left; but drum membrane becomes reddened.

CASE LXV. *Arrested development.*—A. G., *æt.* 9, has a diminutive auricle, and a very narrow auditory passage on the left side. The right ear is

normal; says he hears the watch a very little on the left side. The hearing power on the right is normal; the tuning-fork is heard better on right side.

The causes of diseases of the internal ear, so far as they may be deduced from the cases I have seen in private practice, may be classified as follows:—

<i>Traumatic</i> .—Injuries producing mechanical damage to the terminal auditory apparatus	4
Long-continued exposure to concussions producing congestion and inflammation of the internal ear:—	
Telegraph operators	2
Officers in navy	1
Boiler-makers (not included in table)	8
<i>Idiopathic</i> .—Hemorrhage into internal ear producing atrophy of nerve tissue	11
Inflammation of the parotid gland from which a catarrhal or periosteal inflammation extended to the labyrinth	2
Cerebro-spinal meningitis producing inflammation of the auditory nerve or the labyrinth or both	8
Scarlatina causing an extension of pharyngeal or meningeal inflammation to the labyrinth	2
Measles producing same effect	1
Basilar meningitis extending to auditory nerve or labyrinth, or both	7
Primary inflammation of labyrinth or circumscribed (about root of auditory nerve) basilar meningitis	8
Internal administration of quinia causing congestion and inflammation of base of brain and labyrinth (?)	4
Dr. Duffy's cases	(3)
From causes unknown	14
Arrested development	1
Total	65

ART. VI.—*Case of Aneurism of the Thoracic Aorta of long standing; gradually perforating the sternum, the orifice being plugged by a large clot which admitted of oozing and hemorrhage.* Observed in the Medical Clinic of Prof. Da Costa, at Jefferson Medical College. Reported by W. H. WEBB, M.D. (With four wood-cuts.)

THIS case, exhibiting so many striking features, was under observation from November 19, 1866, at which time it first presented itself at the Medical Clinic of the Jefferson Medical College. The history and condition of the patient at that time were thus noted:—

Ellen B., 35 years of age; native of Ireland; for a number of years a resident of Philadelphia and its vicinity; has had eight children, the youngest, which is still nursing, was born September 23, 1866. Her constitution and general health had been excellent from childhood. There was no hereditary tendency to disease; and her habits and mode of life have always been regular.

She stated that for three years previous to her coming to the College clinic, she had been troubled with shortness of breath and palpitation of

the heart, and with a beating in her chest on exercise, all of which had been caused by a fright. That one night in September, 1862, she was awakened by a noise in her house, and in getting out of bed came in contact with a strange man; was much frightened, but succeeded in getting him out, after which she overheard conversation outside, to the effect that they would return when the moon went down. After the party had left she started off, with one child on her arm and another by the hand, across the fields and over fences to her nearest neighbour, a distance of about a quarter of a mile. Since that occurrence she had been troubled with beating in her breast. Her husband was in the army at the time, and it is supposed that the party was after bounty money.

It was noticed that the chest was unusually prominent, with distinct bulging at the upper part of the sternum, which was more perceptible on the left than the right side. There was also a very evident pulsation, particularly on a side view, and especially at the bulging; so powerful was it at the latter spot as to raise the hand, but with distinct intermissions. The chest had gradually assumed the form now presented; previous to the fright there had been no deformity.

She had not lost much in weight. Her colour was pale; expression anxious and uneasy; pulse, when standing, was 100, when recumbent, 92. The left radial and ulnar pulsations were distinct, as also those of the right carotid; that of the right subclavian very indistinct, and thence to the wrist it was imperceptible.

Sometimes her sight was defective; there was no headache or vertigo, or difficulty in deglutition, or hoarseness, yet the voice was not so strong as it had been previous to her trouble, though it was not changed in character. Her respirations were 24; tongue but slightly coated; appetite good; bowels constipated.

There was pain in the lower part of the bulging, and over the sternum, not constant, but sharp and lancinating, more severe in daytime than at night, but had no connection with embarrassed respiration with which she was sometimes troubled.

Percussion, which was painful, showed the most obvious dullness to be over the bulging and upper part of the sternum; lower down the dullness was connected, on the left side, with the cardiac dullness.

On auscultation, two sounds were heard over the mass; the first heavy and dull; the second short, not sharp or very distinct. The first sound corresponded with the beat. There was no blowing sound or thrill. The heart was not enlarged. Its first sound was rather dull and heavy, but not comparable in heaviness or force with that over the pulsating mass; its second sound was normal, but lacked sharpness and distinctness. The heart's impulse was strong, but not very forcible, and but slightly extended.

The diagnosis made was, aneurism of the aorta, affecting chiefly the vessel above its origin, the arch properly speaking not as yet being decidedly involved.

The treatment ordered was liq. ferri subsulphat. gtt. vj three times daily, with digitalin, gr. $\frac{1}{80}$ every six hours, and as much rest as possible.

1867, *Feb.* 18. She returned to the college clinic, stating she had not followed the treatment strictly on account of sickness of her youngest child. The tumour had increased since her first visit. There was no difficulty in deglutition; the voice remained the same. The sounds were the same; no murmur or thrill. The sounds in the sac were intermittent, as also the left pulse. On the right side no pulse was perceptible, and the right side

was colder than the left. The dulness was greater. The aortic arch had become implicated by the extension of the disease. Treatment continued, and empl. belladonna ordered to be placed over the mass for its protection, as well as to allay pain, with which she was sometimes troubled.

1868, *Dec.* 10. She returned to the clinic, when her condition was noticed to be about the same.

1869, *Jan.* 4. She returned to the clinic; her condition as regards the tumour remained as before. She was then pregnant. Treatment was continued.

Nov. 29. Since her last visit to the clinic the patient has been confined (March 18); her labour had no influence upon the tumour, as it presented about the same signs. Deglutition remained good. There was a feeling of great weight in the chest, with pressure and beating over the spinal column posterior to the tumour; and she was troubled with a frothy expectoration. The voice was unchanged. In place of the former treatment, vini ergot., \mathfrak{z} ij three times a day, with empl. opii over the seat of pain, were ordered.

1870, *Sept.* 17. The patient presented herself at the clinic, and it was noticed that the tumour had increased in an outward direction; the sounds remained as before; no murmur or thrill. She had considerable pain over the mass. Her chief complaint, however, was numbness of the feet, and obstructed breathing when walking. The right pupil was much the larger; there was some difficulty in deglutition. The right pulse was not perceptible, but the left was distinct. She was now ordered potassii iodid. gr. v, to be gradually increased to gr. x, three times a day, also tinct. opii deodorat. gtt. v, tinct. cannabis, gtt. iij, mist. glycyrrhizæ comp. \mathfrak{z} ij, to be taken as required, for dyspnœa.

Dec. 22. Her general health continued good. There was more irregularity of the heart's action, otherwise her condition was the same; there was no perceptible increase in the tumour. A pill containing belladonna was for the time ordered.

1871, *July* 31. The patient was at the clinic; the tumour had increased in size, and was pointing over the sternum, with discolouration of the surface. On feeling over the mass, several hard points were quite perceptible. She complained of pain and soreness in the back. The breathing was oppressed. Ordered potassii iodid. gr. x, tinct. verat. virid. gtt. iij, tinct. cinchon. comp. \mathfrak{z} j three times a day. Empl. belladonnæ.

1872, *Nov.* 13. She stated that in May last, while at house-cleaning, she received a severe blow upon the tumour, caused by a large scrubbing-brush falling upon it; and it was noticed that after this accident the tumour had *diminished considerably* in size, though it was larger then than it was some years ago. There were two sounds; the first heavy and dull, the second distinct, with no murmur or thrill. There was no pain, but she had occasional difficulty in swallowing. Pulse 110, the right being imperceptible; respirations were 24 per minute. The right pupil was considerably larger than the left. There was no cough or alteration of the voice. Treatment continued.

28th. The patient states that, on the night of the 25th inst., she awoke with a smothering sensation, and could not speak; her breathing was very rapid, and there was loss of power of the right side. She remained in that condition about three hours, when she gradually recovered; the bowels had not been moved for nearly a week. The tumour was

noticed to have enlarged very much; her expression was denotive of great distress. Treatment continued, with pil. rhei comp., one, night and morning.

Dec. 5. The patient stated that she thought she had taken cold, as she felt so sore about the breast, especially upon the left side, and around and under her left shoulder. The pain about her breast last night was so intense and constant that it prevented her from taking the recumbent posture, and she had to content herself in a chair all night.

1873, *July 28.* She now complains of having chills at night, of losing flesh, and of pain in the back and under the left scapula. Treatment continued, except pil. rhei comp., in place of which a pill consisting of quiniæ sulph. gr. iss, ext. cannabis, gr. $\frac{1}{4}$, ext. hyoseyami, gr. j was given three times a day.

Sept. 21. Her general condition not materially altered, but the pulsating mass was larger. The iodide of potassium, which she had for some time taken irregularly, was abandoned.

Fig. 1.



Sphygmographic tracing taken Nov. 23, 1873, the patient having been kept at perfect rest for three hours previously.

1874, *Jan. 14.* A note was received from the patient, in which she states, "I would like to see you to-morrow, if convenient, on account of my breast; the plaster fell off to-day, and it [the tumour] looks in appearance worse than I ever saw it. I am pretty lively, but it has preyed on my spirits greatly." The swelling presented a very ugly appearance, having, apparently, ecchymosed spots, radiating from which could be distinctly seen the cutaneous capillary vessels, intensely distended. She complained of a burning pain in the tumour, but this was not constant. At the most anterior portion was a spot about three-quarters of an inch in diameter, covered by the merest film, and looked as though ulceration was taking place, and the current of blood could be felt beneath it. A plaster was applied consisting of equal parts of empl. opii and empl. aconitii, which was worn as much for protection of the mass as to allay pain. The plaster consisted of two pieces: one piece, about two inches in diameter, was placed on the apex of the tumour; the other piece was about eight inches in diameter, with a circular piece of about one inch in diameter cut out of its centre, and this plaster was cut through from the circle to the outer edge, so that it would the better accommodate itself to the mass. (See Fig. 2.)

Feb. 21. She was found to be in great distress of mind, owing to her finding a spot of blood upon her under-garment, which had oozed through the pores of the sheepskin upon which a plaster had been spread. She also had considerable pain in the left side of the neck, anterior to and including the sterno-cleido-mastoideus muscle, running down below the clavicle and extending through to the back of the same side; there was some cough, with a thick, tenacious yellow expectoration, streaked with blood. The pupil of the right eye was much larger than that of the left;

at times there was some difficulty in deglutition. Morph. sulph. gr. $\frac{1}{6}$ was ordered to be taken occasionally.

Fig. 2.



Appearance of tumour Feb 23, 1874, when the serum of the blood was oozing through the pores of the sheepskin upon which the plaster was spread.

26th. About 4 $\frac{1}{2}$ P. M. the tumour ruptured externally at its most anterior portion, and it was stated that "the stream of blood was about the size of a lead pencil, and that after she had lost about a quart of blood it suddenly stopped." Comparing her condition with that of the previous day, and examining the various cloths saturated with blood, it would be safe to say that she lost from sixteen to twenty ounces of blood. She was found almost pulseless with blood still oozing from the rent, which was immediately arrested by the application of liq. ferri subsulph. dil. (two parts to one of water).

March 3. Prof. Da Costa visited the patient, and found her in her usual bright condition. There had not been any loss of blood since the 26th ult.; no murmur or thrill could be detected; there was considerable cough, which was relieved by a narcotic mixture.

4th. There had been considerable hemorrhage during the night, but upon the free application of liq. ferri subsulph. dil., it was arrested.

6th. She has become very restless; her expression has changed very much during the past twenty-four hours; she has some trouble in deglu-

tion, and complains of considerable pain in the tumour as also in the left shoulder, with numbness and loss of power in the arm of that side. Morphia sulph. gr. $\frac{1}{4}$, which had been given p. r. n., is now taken every two hours.

7th. The tumour has enlarged very much during the past twenty-four hours, which is more perceptible upon the left side. She has lost considerable blood during the day owing to the reopening of the rent; deglutition is difficult and painful, the pain being burning in character; intense thirst; no fever; pulse frequent and easily compressible.

10th. The pain in the tumour has been excruciating for the past two days, requiring morphia sulph. gr. $\frac{1}{2}$ every hour for its relief. The expression of countenance is indicative of the most intense suffering; the sunken eyes, the pinched nose, the hollow cheek, the upper lip drawn above the teeth, the skin cool and glossy, and the pulse rapid and almost imperceptible indicate her suffering and exhaustion. Stimulants and morph. sulph. were given throughout the day.

11th. Passed a rather comfortable night, was somewhat cheerful, and notwithstanding her extreme weakness she endeavoured to give a description of a ludicrous dream she had had during the night. On examining the tumour it was found that protruding from the rent in the sac wall, at its most anterior portion, was a mass of laminated fibrinous clot, through which the serum of the blood had been oozing for some hours; the liq. ferri subsulph. dil. was applied, which would arrest it for a time only. The difficulty in deglutition had increased, was very painful, and was worse with liquids than with solid food; thirst is very annoying. There is, however, no fever; the pulse is small and frequent.

12th. There was considerable hemorrhage during the night and morning, which was very difficult to control, for, as soon as a good coagulum would be formed by the liq. ferri subsulph. dil., applied by means of the hand atomizer, it would be washed away. The bleeding stopped, however, of its own accord after the loss of from eight to twelve ounces.

13th. Very restless all night; respiration difficult and painful; the pain on deglutition has increased, and at times she refuses to take food or drink. The fibrinous clot, which has been gradually protruding for the past few days, is now about ten inches in circumference, and protruding about three inches beyond the sac.

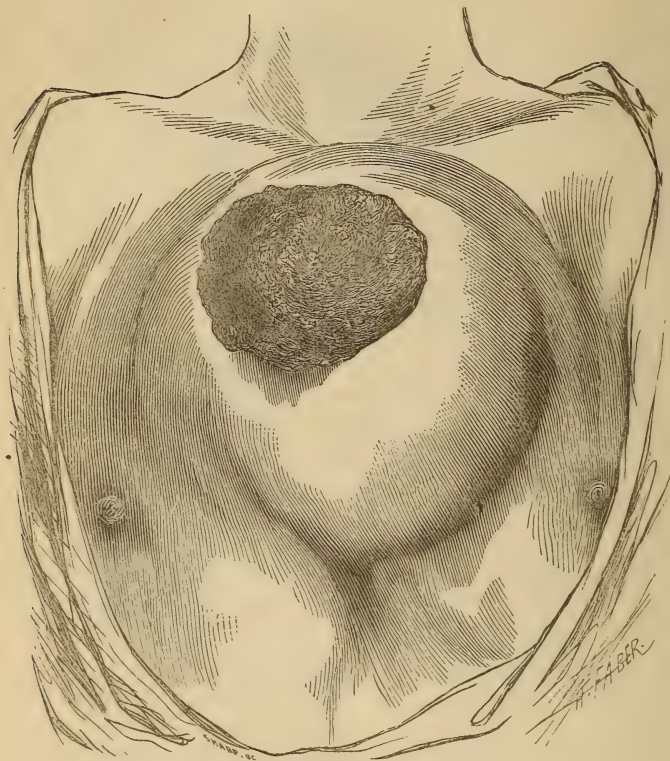
14th. Her articulation has been difficult since early last evening, and she is at times unconscious, refusing food and drink. The position most comfortable to her, when in bed, was upon her right side, and as the result of a test, more pain was experienced when lying upon the back than upon the left side. She died of exhaustion at 8 P. M.

Eighteen hours after death a plaster cast was taken of the tumour, including the space bounded by the thyroid cartilage to the ensiform cartilage, and laterally on a line with each axillary space (See Fig. 3. The tumour had receded considerably from the time of death to the taking of the cast, the body having been placed upon its back, consequently the model does not represent the tumour as large as it was during life), after which, with the kind assistance of Dr. A. C. W. Beecher, the post-mortem was made; present Drs. Andrews, Allis, Hearn, Rex, and Frank West.

An incision was made around the mass of protruding clot, about half an inch below the margin of the skin surrounding the same, thence down the median line to a few inches below the ensiform cartilage; an incision was also made along the anterior portion of each clavicle to meet the cir-

cular incision, the flaps thrown aside, and the specimen, which included the sternum, costal cartilages, and about two inches of each clavicle, was removed.

Fig. 3.



Tumour showing protrusion of the clot.

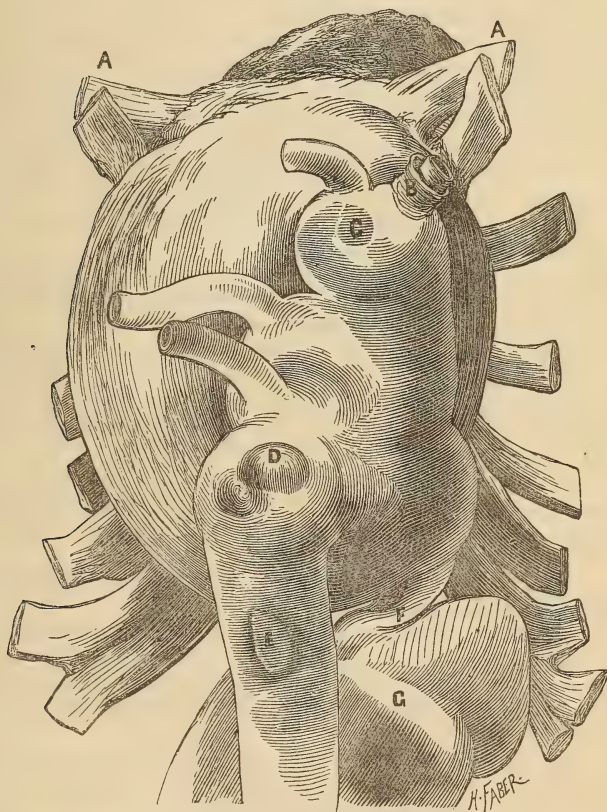
The inter-clavicular portion of the sternum is almost entirely absorbed; the sterno-clavicular articulations are intact. The sternum is absorbed down to the upper margin of the third costal cartilage, extending on the right side to within half an inch of the right margin; on the left side the sternum is entirely absent, including a portion of the costal cartilages of the first and third ribs; the sternal extremity of the second rib of the same side is necrosed and its cartilage entirely absorbed. The erosion of the sternum on its posterior surface extends down to near the lower margin of the third costal cartilage.

The aneurism commences about one inch and a half above the aortic opening and terminates at the beginning of the thoracic aorta, involving the whole of the arch. The sac extended forward, attaching itself to the anterior wall of the chest. The pleura was closely adherent on both sides of the sac, and was pushed off from the middle line as the sac advanced towards the sternum; the upper and inner portion of the left thoracic cavity being decidedly encroached upon by the sac. Marked adhesions of

the apex and anterior portion of upper lobe of the right lung to the costal pleura; the apex and upper lobe of left lung are adherent to the aneurism.

The innominate artery is much dilated, about an inch in diameter at its origin; above it is much larger; a dilatation exists on its inner side at the root of the right common carotid artery, and it there has the capacity of a hulled walnut, evidently a beginning secondary aneurism. In the third portion of the arch, on its outer and left side, is another marked dilatation as large as half a walnut, which also shows the beginning of another aneurism, which would eventually have become fused into the main sac.

Fig. 4.



A posterior lateral view of the specimen, showing the dilated innominate artery and the dilatation on the outer and left side of the third portion of the arch, and also the separation of the coats of the subclavian artery.—Posterior lateral view of the specimen, showing, A A, the clavicles; B, the separation of the coats of the subclavian artery; C, the dilated innominate artery; D, dilatation on the outer and left side of the third portion of the arch; E, plate of ossific matter; F, first portion of aorta, the pericardium having been removed; G, the heart.

Large patches of ossific matter and atheroma extend down through the remainder of the aorta.

The aneurismal sac passes up from the front of the arch of the aorta to

the top of the sternum, below to a line with the upper portion of the ensiform cartilage. On the left side it extended beyond the costal cartilage and overlaid the ends of the five upper ribs, and on the right side about half way over the costal cartilages.

On the posterior portion of the arch of the aorta is a deep longitudinal groove in which laid the trachea. The trachea was much flattened at its bifurcation, and about three inches above was a marked indentation; both the flattening and indentation remained after the removal of the trachea from the tumour.

The anterior margin of the sac is attached to the sternum at the point of erosion, and when it became perforated, and until the skin ruptured, the skin and cellular tissue formed the upper and anterior portion of the sac wall. The whole of the sac is filled with a very solid clot, which extends through the sternum, and by its pressure forwards the cellular tissue and skin were absorbed until the skin parted, when it protruded, thus plugging the orifice, the clot advancing, the opening in the skin enlarging until the time of death, when the clot extended beyond the surface level of the body fully three inches and measured in circumference, at its base, ten inches. The clot burrowed down from the opening through the sternum to the superior margin of the fourth costal cartilage; above to the top of the sternum; two and a half inches to the left of the middle line and one and a half inches to the right of the same.

The pouches in the innominate artery and third portion of the arch are also filled with very solid clots. The current of blood was kept up between the clot in front and the posterior wall of the aorta.

With the specimen is included about one inch of the right subclavian artery, the external coat of which is separated from the internal coats (see Fig. 4); but as to how far this separation extended onward was not ascertained, and as to how far it extended downward could not be determined without material detriment to the specimen.

Connective tissue about the sac is very dense and closely adherent, and very markedly so about the arteries and veins in the neighbourhood. The cellular tissue behind, above, and anterior to the upper portion of the sternum, is almost as dense as cartilage.

Pneumogastric nerve of the left side is flattened opposite the tumour, and closely invested in cellular tissue.¹

Heart one-third less than the normal size, with considerable fat upon its surface. Structure of the ventricles rather dense; auricles very flabby. Valves opaque and somewhat roughened, but competent; the heart tissue free from fat. There was about a half pint of straw-coloured serous fluid in the pericardium.

Lungs. The upper lobe of the left lung somewhat compressed; lower and posterior portions of both lungs, particularly the right, congested, probably hypostatic. No fluid in the pleural cavities.

The autopsy was made at the request of the patient—a woman of more than ordinary intelligence and education.

About fifteen months previous to her death, she stated, to the effect, that she knew her case was a rare one, a disease in which the struggle between soul and body was useless, and the result so sure but so stealthy; that it had excited more than ordinary interest in those of the medical

¹ This same feature was noticed, but unavoidably omitted, in the case reported in the *Philadelphia Medical Times*, vol. iii. p. 820, 1873.

profession who had seen it; that an examination could be made at the proper time, as it might be the means of saving the life of some fellow-being; and that that portion of her case being of the most interest, she bequeathed to her medical attendant.

The case is familiar to the students and graduates of the various classes of the Jefferson Medical College, from the session of 1866-7 to that of 1873-4 inclusive; and when called upon to be present at the College clinic, which was done once or twice during each session, her acquiescence was always pleasant, and she seemed as much pleased to know that she was the means by which so much instruction could be gleaned by the students, as they were anxious to see and examine her case.

It is a noteworthy fact that the patient nearly always maintained a cheerful frame of mind; notwithstanding that she had been time and again assured by those whom she had consulted, that her life hung by the merest thread, she but rarely experienced any depression of spirits or felt any terror at the idea that, probably, in a second's time, without a moment's warning, her life would pass away. The time did come and it lasted for days: days of terrible suffering that only a woman can endure.

Irrespective of the calm mental condition, this case is chiefly remarkable for the following circumstances: 1st. Its duration, a period of about *eleven years*. 2d. The aneurism being uninfluenced by her pregnancy and the throes of labour. 3d. The blow received from a large scrubbing-brush falling upon the tumour, causing it to diminish considerably in size, a result contrary to any reasonable supposition. 4th. The time elapsing between the first hemorrhage to the termination of the case, a period of about sixteen days: and 5th. The use of the hand atomizer to control oozing and hemorrhage, for by the use of this apparatus crevices and interstices were under complete control of the chemical styptic, until the exhaustion of her strength rendered all interference nugatory.

Medical literature is not rich with the records of cases of aneurism of the thoracic aorta, where external rupture has occurred, it also being a form of termination exceedingly rare. Having had access to the libraries of the College of Physicians of Philadelphia, and of the Pennsylvania Hospital, it was thought that a synopsis of the cases found upon record would not be uninteresting to the profession. Seventeen cases have been collected, and they have been tabulated in the order in which they have been recorded.

Table of Seventeen Cases of Aneurism of the Thoracic Aorta

Case.	Recorded by	Where recorded.	Sex.	Age.	Causation and early history.	Marked phenomena during progress of case.
1	W. Hunter	Med. Observations and Inquiries, vol. i., London, 1763	M	39	Worked very hard at his business, stay-maker, when he was very weak just after an illness of nine months. First began to be uneasy in his chest.	Swelling between the cartilages of the second and third ribs of the right side; it was very hard and painful on pressure. Pain darting through to right shoulder; strong pulsation of the tumour, perceptible to the eye; dyspnœa; discoloration of skin some months before rupture; most ease when lying on left side; considerable cough.
2	Dickson	Med. Observations and Inquiries, vol. iii., London, 1769	M	39	No cause given. Tumour appeared at the anterior extremity of the right clavicle, of the size of a walnut, had been increasing for about three months.	Tumour had a strong pulsation; clavicles were separated from the sternum, the space was filled up by the tumour; five months before its appearance, he had violent pains in the breast and right collar bone; the skin became discoloured and painful to the touch, as if pins and needles were running into it.
3	John Moodie	The Medical and Physical Journal, vol. xi., London, 1804	M	34	Kicked by a horse in the left breast three years previous to the appearance of tumour.	The tumour was attended with a strong pulsation; his rest undisturbed.
4	Joshua E. White	Medical Repository, vol. vii., New York, 1804	F	55	No cause assigned. She had been for many years affected with rheumatism.	Tumour was under the upper part of the sternum; during the last three weeks of her life the swelling increased rapidly; skin discoloured; strong and violent pulsation, evident at the distance of several feet; pain and restless nights.
5	Joseph Ward	London Med. Repository, vol. xx., 1823	M	56	No cause assigned.	Large tumour on right side of chest, below the clavicle; dyspnœa; excessive pain in right arm; tumour increased; a dark spot appeared, from which arterial blood oozed.
6	Mr. De-lort	Phila. Journal Med. and Phys. Sci., vol. xiii., 1826	M	50	Had been subject to palpitation three years ago. Health had undergone no alteration till an attack of pleurisy about a year ago, since which time he had not been well.	Dyspnœa; palpitation frequent; sternum, which had previously appeared more prominent, exhibited on its anterior left surface, and about the level of the fourth rib, a fluctuating tumour, which gradually increased; dyspnœa now so great that he was obliged to remain in the sitting posture; apex of tumour opened and a little blood oozed out, mixed with pus; suppuration abundant; tumour disappeared; another formed in three weeks, fluctuating and pulsating; the skin of apex became gangrenous, and the sac lessened a second time, pus escaped, and some blood, rather discoloured; next day tumour had disappeared; digestion became imperfect, and diarrhœa supervened.
7	Alexander Rainy	The London Med. and Phys. Journal, N. S., vol. iii., 1827	F	48	Cause not stated. Had been subject to palpitation for two years.	Dyspnœa; paroxysmal cough; palpitation distressing; fourth and fifth ribs at their anterior extremity more prominent, and extremely painful on being touched; skin discoloured.

with External Rupture, for the most part not immediately Fatal.

Duration of case.	Duration of case after rupture.	If one or several ruptures.	Pathological appearance.	Remarks.
About three years	About five weeks	Several ruptures; more or less oozing from first to last	Sternum eroded through; left subclavian and jugular veins compressed by the dilated artery, but little left of their natural capacity and appearance; sac pressed against the trachea, the substance of both almost destroyed. Some of the bodies of the vertebræ were almost eroded through to the spinal canal.	First case the writer of the present article has been able to find on record. It came under the care of Dr. Hunter in December, 1749, and died October, 1752, at St. George's Hospital. He says: "I gave it as my opinion that it was an aneurism of the aorta, that it was absolutely incurable; and that he would most probably die of its bursting either outwardly or inwardly."
Less than two years	Less than four days	Two ruptures, oozing in the interval	The first bone of sternum almost destroyed; also considerable of first rib on right side; the right clavicle much eroded, the other much diseased. Several small pieces of ragged bone adhering to the inside of the teguments, and others mixed among clotted blood.	Case came under the care of Dr. Thomson, Surgeon to the London Hospital, July, 1762, and died February, 1763.
About three years	Less than twenty-four hours	Two ruptures	Lungs paler than usual; carotid and subclavian arteries were a little ossified. The aneurismal sac was ossified in several places. Some of the vertebræ were eroded; the sternum was eroded through.	Case came under observation November, 1783, died the following month.
Cannot be stated for the want of data	Died immediately after rupture	One rupture	Autopsy not permitted. The orifice was about the size of a dollar. The clavicles were separated from the sternum, the latter considerably elevated.	Case occurred in May, 1799. Two small punctures had been made in the anterior part of the swelling, at patient's request, upon the supposition of its being an abscess. The person who made the punctures said, "it cut like gristle."
(History incomplete.) Under observation about 14 months	About twenty-four hours	One rupture	"Nothing very particular presented itself."	
About nine months	(No distinct rupture.) A fistulous opening admitting of discharge, for a few months, of pus, and blood discoloured		Body much emaciated; chest very prominent; opening in the sternum about the fourth rib an inch in diameter, above this another opening about four or five lines in diameter. Tumour of the size of an infant's head of one year old, between the two lungs. Anteriorly the tumour was adherent to the pericardium; heart hypertrophied.	This patient evidently died of exhaustion, which was increased by an attack of diarrhœa.
About one year	Died immediately after rupture	One rupture	Body much emaciated; completely exsanguinous; left mamma purple, with an opening externally, the size of a penny; bulk of mamma greater than in prime of life.	

Table of Seventeen Cases of Aneurism of the Thoracic Aorta

Case.	Recorded by	Where recorded.	Sex.	Age.	Causation and early history.	Marked phenomena during progress of case.
8	Not stated	The Lancet, vol. ii., London, 1828	F	53	Cause not stated. Excepting a cough, to which she had been subject for 13 years; had always enjoyed good health. Pulsating tumour right of sternum, just below the clavicle; had previously experienced great pain in those bones, and extending along the side of the neck; swelling gradually enlarged and became painful.	Below the right sterno-clavicular articulation a circumscribed prominent swelling with circular basis about three inches in diameter, elevated at its centre into a conical protuberance; base occupies the right half of the sternum at the junction of the second and third ribs with that bone, and the sternal articulation of the right clavicle; swelling elastic, and pulsates throughout, the beating being sensible to the eye as well as to the touch; cough with blood-streaked expectoration; has pain in the head when she lies on the right side; apex of the swelling discoloured.
9	John Reid	Edinburgh Med. and Surg. Journal, vol. liii, 1840	M	31	He stated that six years ago he began to complain of pain behind the upper part of the sternum; that twelve months after this a tumour about the size of a nut presented itself near the sternal end of the right clavicle; and that he has been troubled with dyspnoea. Habits temperate, and general health good.	Tumour, pyriform shaped, projected about three inches in front of the sternum, about three inches and a half in circumference; pulsating; there was a loud bruit over the tumour, and also accompanying the sounds of the heart; impulse strong and felt below the sixth rib; tumour increased in circumference, and projected from its anterior surface a smaller tumour, and prolonged outwards two inches beyond the surface of the broader tumour below; apex became first livid, and then of a dark colour.
10	M'Intyre	Trans. Path. Soc., vol. i., London, 1848	F	53	Cause not stated. Had a swelling on right side of the chest. Dyspnoea, and sensation of distress in the chest.	Swelling between the first and second ribs close to the sternum, edge of which it seemed to overlap; it was the size of a large walnut, with distinct, strong pulsation; tumour became irregularly oblong, bulging at each end; it gradually increased, then became obviously reduced in size, remained stationary awhile, then subsided rapidly, losing its prominence, its existence evidenced only by pulsation and dullness on percussion. She now enjoyed better health than for many years. It again increased, gained its former size, which was hastened by an attack of bronchitis; the skin became red, a slough appeared at the upper part of the tumour, formed an aperture by which blood escaped.
11	Wm. Stokes	Diseases of the Heart and the Aorta, Philada., 1855	F	Bet. 35 & 40	Cause not stated.	Pulsating tumour in the lower sternal region; discoloration of the skin over the most prominent part of the tumour, followed by a slough and separation of the integuments, so as to display the outer surface of the coagulum. After some days the coagulum gave way, and a deluge of blood was poured out. The nurse instantly stuffed a portion of a cotton apron into the opening in the chest; patient recovered for the time, and for days subsequently her life was depending upon the precarious support of a cotton rag.

with External Rupture, for the most part not immediately Fatal.

Dura- tion of case.	Dura- tion of case after rupture.	If one or sever- al rup- tures.	Pathological appearance.	Remarks.
About nine months	About seven weeks	Several rup- tures, oozing in the interval	Aneurismal tumour filled the middle and upper part of chest, from the base of the heart to the root of the neck; it adhered to the back of the sternum, clavicular articulation in front, and pressed on the trachea behind; arteria innominata involved in the right and anterior part of the tumour; it was dilated and formed part of the aneurism. Anterior surface of the aneurism adhered closely to the back of the sternum throughout the upper half of the bone. Back of the tumour had become firmly adherent to the front of the trachea, and had pressed on the tube so as to flatten it slightly.	Case came under the care of Mr. Lawrence, at St. Bartholomew's Hospital, 1828. Pathological appearances in this case simulate very much those of the one just recorded: the situation of the tumour; its adherence to the back of the sternum; the flattening or indentation of the trachea, and the dilatation of the innominate artery.
About five years	Two days	Two rup- tures. Some oozing the day previ- ous to first rupture	The most dilated part was near the origin of the arteria innominata. A rounded opening in the walls of the sac passed partly through a notch in the upper and right side of the sternum, and partly through the interval between the sternum, first rib, and clavicle. Left ventricle of heart dilated and hypertrophied. Semilunar aortic valves shortened; thickened along their margins, and were inadequate.	
About seven- teen months	Not stated. (No data)	One rupture	Swelling lost much of its prominence; the aperture was nearly central; sternum perforated, and would admit the finger, round and smooth; tumour had contracted extensive adhesions with the surrounding parts. An adjoining portion of lung had a carnified appearance; heart flaccid. Neither that organ nor the thoracic tumour had been opened.	
Not stated. (No data)	Not stated. (No data)	Not stated. (No data)	Not stated.	

Table of Seventeen Cases of Aneurism of the Thoracic Aorta

Case.	Recorded by	Where recorded.	Sex.	Age.	Causation and early history.	Marked phenomena during progress of case.
12	Wm. Stokes	Diseases of the Heart and the Aorta, Philada., 1855	F	46	Not stated.	External tumour, covered merely by integument, the latter slightly discoloured and becoming thinned. Shortly after her admission into hospital, skin gave way, and an opening as large as a four-penny piece was found, through which a large quantity of blood, partly fluid, suddenly issued. This bleeding was partly checked by a large coagulum blocking up the orifice; slight oozing continued for a day or two, when another alarming hemorrhage took place. In this way the case proceeded for about ten days, the blood gushing at every second or third day, and oozing out in the intervals.
13	J. H. Packard	Amer. Journ. Med. Sci., vol. xxxvi., 1858	M col'd	38	He stated that he had enjoyed good health up to July, 1857, when he had a slight cough; soon after this he perceived a lump in front of his chest.	The lump had attained the size of a foetal head, seated at the upper part of the sternum, to the right of the median line; pulsation was evident all over it; sounds of heart transmitted, deepened in pitch, and, as it were, renewed or intensified in the tumour; the right radial pulse was a little feebler than the left, but was not permanent. Pain shifting between shoulders and tumour; increase of the swelling rapid during latter stages of the disease; discoloration of the most prominent part of tumour.
14	Prof. Gross	Proc. Path. Soc. of Phila., vol. i., 1860	M	37	Had always been in ill health.	Disease apparently of only six months' duration, as far as it had attracted attention. Great prominence of the upper portion of the chest; a pulsating tumour; intense dyspœa; great emaciation. About six weeks before death an abscess pointed near the median line, three days after it burst and discharged sanious matter.
15	W. H. Dickinson	Med. Times and Gaz., vol. i., 1860	F	51	Had suffered occasionally from pain passing down the outside of the left arm to the ends of the fingers. Early in September she observed a small projection on the front of the chest close to the left side of the sternum, on a level with the nipples.	March 12, there were two brownish-red spots in upper part of tumour, from which oozed a little watery fluid. On the 24th inst. she complained of a sudden sensation of faintness, immediately afterwards the blood gushed from the aneurism; fell into a state of collapse.
16			M col'd	49	Was accidentally thrown down violently; two years after it was noticed that a tumour began to make its appearance on the right side of the chest.	Not stated.

with External Rupture, for the most part not immediately Fatal.

Dura- tion of case.	Dura- tion of case after rupture.	If one or seve- ral rup- tures.	Pathological appearance.	Remarks.
Not stated. (No data)	About ten days	Several rup- tures, oozing in the interval	No autopsy. On removing the com- presses, the external opening was found greatly enlarged, being of the size of a half-crown piece.	
Less than a year	About ten hours	Several rup- tures, previ- ous ooz- ing	Anterior wall of aneurismal sac, as well as the skin over it, extremely thin, and separation difficult. "On introducing my hand into the sac, I felt several pieces of roughened bone <i>within its cavity</i> . Two of these evidently remnants of the sternum; they were irregular in shape, bare, and eroded." The end of the right clavicle, and up- per two ribs on the same side, in a similar condition, projected through the wall of the sac; both sterno-clavicular articula- tions were absorbed. Above the second rib sternum entirely gone except a slender strip on the left side.	With reference to the bone within the cavity, this case simulates that recorded by Dr. Dickson.
Less than a year	Not stated	One rupture	Right lung adherent to tumour and hepatized; the pleura thickened, and contained at least three pints of coagulated blood; pericardium adherent to heart; left lung adhe- rent, and some effusion in the left pleural cavity. Sternum at one place absorbed, and several ribs had given way; innominate artery somewhat dilated.	The immediate cause of death was the opening of the tumour into the pleural cavity, and the case is, therefore, particularly inter- esting as showing that death may result by internal rupture after external rupture has taken place.
Less than a year	Half an hour	One rupture	A hole as large as the palm of the hand, formed by erosion of the second, third, and fourth ribs, and left edge of the sternum. Aorta very atheromatous, especially in the abdomen.	
Less than a year	Less than twenty- four hours	One rup- ture, oozing for some days previ- ous	Dr. Allis has the specimen dried, consisting of the sternum, a por- tion of all the ribs of either side, and the aneurismal sac, which is attached to part of the posterior part of the sternum and some of the ribs of the right side. It shows that the intercostal muscles be- tween the fourth and fifth, and fifth and sixth ribs had been ab- sorbed for the space of two or three inches, commencing at the right margin of the sternum.	This case was communicated to the writer by Dr. Allis, who in- tends to record it more fully at an early day. It occurred in 1872.

Table of Seventeen Cases of Aneurism of the Thoracic Aorta

Case.	Recorded by	Where recorded.	Sex.	Age.	Causation and early history.	Marked phenomena during progress of case.
17	McCall Anderson	The Lancet, June 13, 1874	M	34	Formerly a joiner. Last four years a French polisher; has been required to lift heavy weights. Habits temperate. Three years ago he complained of palpitation, and twenty-one months after this he experienced sharp pain in the left breast, which extended into the left shoulder and down the arm. "A beating above the breast bone."	Dilated hypertrophy of the left ventricle, with a double murmur at the base of the heart; pulsating tumour in the jugular fossa, tender to the touch; difficulty of swallowing; loud, rasping, systolic murmur heard over the tumour, also over the whole chest, in the vessels of the neck and arms, more marked in those of the right than those of the left side, and in the thoracic and abdominal aorta. Apex beat of the heart situated 3½ inches below and 1½ inch to the left of a vertical line drawn through the nipple; impulse of the heart heaving, and observed over a preternaturally extensive area.

ART. VII.—*The Relation of Ozone to Disease.* By J. F. BALDWIN, A.M., M.D., of Columbus, Ohio.

THE rise and progress of epidemics has always been a subject of great interest, and every theory advanced to solve the problems connected therewith has been favourably received and has not lacked able advocates. No sooner, therefore, had Schönbein announced the nature and properties of ozone, and suggested the hypothesis of its relation to disease, than it was enthusiastically seized upon as the long-sought *entity* by which could be explained the mysteries connected with all epidemics.

The well-known effects of artificial ozone as an irritant of the air passages, and as a deodorizer and disinfectant, suggested that its abundance in the air would lead to epidemics of certain inflammatory diseases; while its absence would allow septic material to accumulate till an epidemic of some one of the zymotic diseases should either arise *de novo*, or be greatly augmented in extent and virulence.

In a recent monograph, I find the following statement, which may be regarded as the most ultra expression of the views advanced by those who adopt these theories:—

"The modern discovery of ozone furnishes us the key to unlock the mysteries of the causes of all fevers, of whatever nature or form or dimension, of either inflammatory, bilious, or typhoid; being all produced by the variation or want of this substance in the air inhaled. There were influences operating in pro-

with External Rupture, for the most part not immediately Fatal.

Duration of case.	Duration of case after rupture.	If one or several ruptures.	Pathological appearance.	Remarks.
About three years	Three days	Several ruptures, oozing in the interval	Nothing remarkable with the exception of a dark, prominent mass, which protruded from the skin immediately above the supra-sternal notch. It had an oval shape, and measured about three inches from above downwards, and two inches across, composed evidently of coagulated blood. It communicated by an aperture in the skin, with an aneurism of the aorta. Heart much enlarged, left ventricle in particular being hypertrophied and dilated.	This case was treated by galvanopuncture, the patient died before a cure was effected.

ducing different diseases of which we were ignorant: *ozone, and ozone alone, furnishes the key* to unlock and reveal the whole mystery."

In discussing the relation which ozone may sustain to disease, I shall consider it as, 1st, a cause; 2d, a remedy; and 3d, a preventive.

I. *Ozone as a Cause.*—The first crude tests that were made led observers to suppose that in pure air ozone existed to the extent of about one part in ten thousand. As more careful and accurate observations were made, this supposed quantity gradually diminished; till finally, as a result of the experiments of that most careful observer, M. Houzeau, he has determined that "the air of the country contains, *at most*, about $\frac{1}{450000}$ of its weight, or $\frac{1}{700000}$ of its volume, of ozone." (*Am. Chemist*, Oct. 1873.) That his conclusion is correct, and that this minute amount is really the maximum, is further shown by the fact that such men as Dumas, Thenard, Berigny, Cloez, Fremy, and others, doubt, or even deny, the existence of ozone in the atmosphere; and that in 1865 an attempt was made in the French Academy to overthrow the belief in atmospheric ozone.

At the very commencement then we must admit the existence of a strong presumption against the efficacy of an agent when so dilute; unless, indeed, we emulate Hahnemann, with his limitless faith in the "medicinal *aura*" of his thirtieth dilution. (*Organon*, p. 226.)

The peculiar odour which is sometimes observed during thunder-storms, and which we now know to be due to ozone, was noticed by the ancients, and was by them compared to that of sulphur. But although this odour is frequently mentioned, as by Homer, Lucanus, Persius, Pliny, and others, I do not find that any significance was attached to it as a cause of disease.

How highly charged an atmosphere must be to produce bronchitis or catarrh has never been determined. Certain it is that a lecturer and his students may remain for hours, in a class-room where the odour is quite strong, without experiencing the least discomfort, or having the slightest symptom of disease. Bence Jones thinks that one part in two thousand is able to cause "dangerous engorgement of the lungs, and even smaller doses, long continued, cause bronchitis and pneumonia." (*Dublin Journ. Med. Sci.*, Feb. 1868.)

"We must confess that ozone in excess, as we produce it in the laboratory, induces certain symptoms of disease; but as yet, we know of no instance in which an excess sufficient to produce the same symptoms exists in nature. An air so charged with ozone as to produce these symptoms would require no chemical test to prove the presence of an injurious agent. It would be an irrespirable air, and it would affect, with varying intensity, all who breathed it." (Dr. Richardson, *Popular Science Rev.*, Jan. 1866.)

In the recent experiments of Mr. Dewar and Dr. McKendrick, reported to the Royal Society of Edinburgh, December 1, 1873, animals were allowed to remain in air, or oxygen, charged with about ten per cent, of ozone, till they perished. After death it was found that the blood throughout the system was venous, and that death by ozone was not due to irritation, but "resembled that caused by an atmosphere surcharged with carbonic acid." (*Nature*, Dec. 11, 1873.)

People living in the country are not more liable to epidemics of influenza and catarrh than those living in the town; while mountaineers, hunters, and sailors, though living almost constantly in a maximum of ozone, seem almost entirely exempt from these affections. Moreover, during the course of my experiments, I, on several occasions, remained all night in a small and close room, where ozone was being generated by the action of sulphuric acid upon permanganate of potassium, and though the odour was somewhat disagreeable, I experienced no further inconvenience, nor had I a single symptom of catarrh.

In truth, all *a priori* reasoning is most decidedly against the theory of the production of disease by atmospheric ozone, and the truth of this reasoning is shown by numerous observations, a few of which I will give.

Dr. Seitz, from observations made at Munich from 1853 to 1855, writes:—

"We found that months in which the ozone was abundant were not characterized by a predominance of catarrhal affections when compared with months in which less ozone was observed in the air. After days distinguished by a great excess of ozone we did not observe the occurrence of a greater number of cases of catarrh." (*Catarrh and Influenza*, 1865.)

From the observations of the Medical and Scientific Club of Königsburg, Prussia, conducted during 1856, the conclusion was reached that there was no connection to be discovered at any time between a malady and the amount of ozone in the air. According to Dr. Hayes, of the Arctic Expedition, in the polar regions where the ozone register is generally at 10 (the maximum), pulmonary and bronchial diseases are almost

unknown. Capt. Pope, of the U. S. Army, makes a similar statement in regard to the table-lands of Texas and Mexico.

Dr. Ireland, of Bengal, reports that on one occasion "a sudden decrease in ozone was followed by a threefold increase of patients in the hospital, and by the prevalence of rheumatism and *influenza*;" when there came an increase of ozone the patients recovered. (*Edinburgh Med. Journ.*, July, 1862.)

The dust-storms of India are most highly charged with ozone, yet Ireland reports: "There is no influenza after dust-storms in India." (*Edin. Med. Journ.*, July, 1862.) The most delicate tests always fail to detect ozone in the air of hospital wards; yet in the Massachusetts General Hospital, during the epidemic of influenza in 1832, "nearly all the patients in the hospital were affected." (*Flint's Practice*, p. 216.) Nor is this an isolated case; for these epidemics visit, with equal severity, the alley and avenue, the city and the country, the mountain top and the mine.

Faber, Wunderlich, T. Boeckel, Houzeau, and many other eminent observers do not believe in a causative influence of ozone upon bronchial affections or other diseases. The special cause of influenza is "independent of appreciable atmospheric changes." (Flint.) It is not due to "any recognizable physical changes in the surrounding air." (Da Costa.)

Mr. Fox, in his recent work on ozone (p. 158), thus concludes: "There is no evidence of any weight whatever in support of the views regarding an etiological connection between atmospheric ozone and certain diseases."

But I will not weary the reader with further quotations, which would be but tiresome repetitions of those already given.

The hypothesis, that a maximum of atmospheric ozone can cause disease, rendered exceedingly improbable by a knowledge of the minuteness of that maximum, and further weakened by the fact of the prevalence of these diseases in localities where, from its ready destructibility, we cannot imagine ozone to exist, has been, I think, completely demolished when put to the final test of observation, which has failed to establish or so much as render probable that ozone acts as even a *predisposing* cause of disease.

II. *Ozone as a Remedy*.—This can be dismissed very briefly. Ozone, artificially prepared, has been administered (?) in the form of the so-called "ozonized waters" and "ozonized oils," to which almost miraculous powers were *at first* attributed. The former, however, on careful analysis were found to contain no ozone.¹ In specimens examined by Boettger, a little nitrous acid was found (*Ph. Cent. Halle.*, 1871); by Kremer, a trace of the binoxide of hydrogen (*Ibid.*, 1872); by Behrens and Jacobsen, hypochlorous acid (*Scientific Am.*, Jan. 31, 1874); and by Ramelsberg, chlorine. (*Ibid.*)

¹ All chemists agree in saying that ozone is insoluble in water.

Dr. Thompson, of London, in a paper read before the Royal Medical and Chirurgical Society, Feb. 26, 1861, asserted that ozonized oils, when administered in phthisis, reduced remarkably the frequency of the pulse. The real value of this agent may be inferred from the fact that "ozonized oil," and "oxidized oil," and "rancid oil," are strictly synonymous terms. (Rand.) Hence we are not at all surprised to learn that, when the experiments of Thompson were extended and repeated more carefully, ozonized oil was found to possess no peculiar virtues. (*Edin. Med. Journ.*, July, 1861.)

Patients affected with phthisis are sometimes sent with benefit into the pine forests. The benefit in these cases has, by some, been attributed to the ozone *supposed* to be produced by the terebinthinate exhalations. Mr. Burgess, the inventor of the method of making paper from wood, found that the introduction, into his bleaching room, of a few drops of turpentine, would not only prevent any further formation of ozone, but would even destroy that already existing.

The benefit derived by consumptives from a residence in Minnesota and other Western States, has been attributed to the abundance of ozone in these localities. The burden of proof, however, lies with the theorists, and they have not yet furnished the demonstration. In truth, the elements involved, in producing the effects due to "change of climate," are too numerous and complex to permit us to select any particular one, as the main or only cause, and we do not want beneficial effects attributed to ozone unless the ozonometer is brought into play.

III. *Ozone as a Preventive.*—Ozone being found in the laboratory to possess deodorizing and disinfecting, or germicide, powers—of which my own experiments have assured me—was then, by inference, regarded as "nature's great disinfectant," which when present would destroy the floating germs of disease, and thus prevent or check an epidemic; while if it were absent the air would, in the words of a recent writer, "soon contain within itself the seeds of inevitable death," and "the wasting pestilence would stride on uncurbed."

This theory presupposes these germs to possess a greater degree of destructibility than is warranted by what we know, from the experiments of Wyman, Beale, and others, of other germs and ova floating in the air. The theory is, moreover, opposed by what is practically found necessary in order to accomplish complete disinfection. The *Oxford Disinfecting Minute* says: "No disinfection can be thorough if a man can live in a room whilst it is going on." J. M. Bryan thinks that "the only true disinfectants are those which produce an atmosphere or vapour in which neither we, nor any other life, can be sustained." (*Brit. Med. Journ.*, Dec. 13, 1873.) W. J. Cooper, in an essay before the Social Science Congress, says: "Before they could use enough iodine to have any effect upon germs it would produce the well-known iodine catarrh. Bromine

would overpower the senses, with its suffocating stench, long before it could disinfect; and, if the air were to be overcharged with ozone, it would be productive of equally deleterious consequences." (*Scientific American*, Nov. 22, 1873.)

The general statement may, I think, be safely made, that fungi and infusorial germs require for their destruction an atmosphere so charged with noxious vapour as to be highly deleterious to, if not irrespirable by, human beings, and that there is no proof whatever that the invisible germs of disease are more easily destroyed.

Ozone is usually ranked with disinfectants, although, according to the report of General O'Neal, it (as permanganate of potassium) seems to be rather a deodorizer than a disinfectant. (*Annual Rep. Army Med. Dep't.*, vol. xiii.)

The conclusion of the Analytical Sanitary Commission on Disinfectants was that it did not possess any great advantage over less expensive and more convenient agents. (*Lancet*, July 26, 1874.) Dr. H. Day speaks of it as inferior to chlorine and bromine, and in many instances, not so applicable as iodine. In my experiments with ozone I found fungi to remain unaffected, unless the air in the bell-glass became perfectly saturated, as indicated by the rapid decoloration and bleaching of the test-papers, when they perished. If so, then, ozone is not superior to the other disinfectants, and if none is germicide unless in suffocative amount—or even if a degree of saturation much less than this is sufficient—we must admit that the probabilities are very strong against the germicide powers of ozone when so dilute as one part in 700,000; which, it must be remembered, is not even its *average*, but is its *maximum*, amount.

This small quantity is found to be speedily destroyed in the presence of any decomposing matter. Thus it is a common observation that ozone can scarcely ever be detected in compactly built portions of a city, except in cold weather, when no decomposition is going on, or in elevated situations, as church steeples, where a feeble reaction may sometimes be detected. In Philadelphia, at my residence on Thirteenth Street, I have tested for ozone in all kinds of weather; in the midst of fog, mist, rain, sleet, and snow; in hot weather and in cold; when the sky was clear, and when it was cloudy; but never—not even during a thunder-storm—have I been able to detect the slightest trace of ozone.¹ We have had all the "bracing and inspiring effect of clear, crisp, and sparkling mornings," but *no ozone*, notwithstanding the opposing theory of Dr. Beard. (*Popular Sci. Mo.*, Feb. 1874.) The general absence of ozone from cities is, indeed, a fact admitted by all observers. (As a specimen of the kind of logic, and of generalization, not infrequently indulged in by enthusiastic

¹ The tests used were prepared for me by an experienced chemist, and were the usual "starch-iodide" papers.

writers on ozone, I may quote the following, by one whose *observations* (?) were evidently made in the *country*: "The ozonoscope held before a half open door has a deep hue given to it. Every one knows the effect of such exposure, the ozonoscope defines the cause." (Dr. Royce, of Buffalo.) In country towns ozone may generally be detected, though I am informed by Prof. Kemp, of Illinois, that such is not the case where impure coal, containing sulphur, is used for fuel. But though ozone can be detected in the air outside of country houses,¹ it can seldom be found within; for so easily and quickly is this body destroyed that I have never been able to detect it in the living-rooms of well-ventilated country residences.

The general fact being then established that ozone does not exist in compactly built cities, two conclusions necessarily follow: 1. A continued local absence of ozone cannot beget epidemics, else an epidemic should have arisen in Philadelphia. 2. The presence of ozone is not necessary for the destruction of the germs of disease, and the consequent limitation of an epidemic; for these diseases enter a city, run their course, and depart, without the presence of ozone being at any time manifest. That these epidemics rarely visit the small towns and rural districts, must be accounted for by their isolation, rather than by attributing their exemption to any agency of ozone; for an epidemic, once introduced into a village, will not infrequently rage as fiercely and destructively as in the non-ozone city. Numerous instances of this were furnished so lately as during the cholera epidemic of 1873.

Webster, in his work on *Epidemic and Pestilential Diseases*, 1799, after tabulating a vast number of epidemics, thus remarks: "It will not escape the most inattentive reader of the foregoing history, that all the violent and general plagues have been preceded or accompanied with remarkable phenomena in the physical world, as comets, earthquakes, explosions of volcanoes, and others of a subordinate kind." And another old writer says: "Mighty revolutions in the organism of the earth, of which we have creditable information, had preceded it. From China to the Atlantic, the foundations of the earth were shaken—throughout Asia and Europe the atmosphere was in commotion." (Hecker, *On the Black Death*.) Curiously enough, these very phenomena, although no longer regarded as associated in any way with the diseases in question, are, nevertheless, those which, by disturbing the electrical tension, are supposed to be instrumental in the production of ozone. Storms also produce ozone, yet Orton, in his work on *Cholera*, says it is an everyday occurrence in India for an epidemic to be ushered in by a storm. The same fact is noted by many other writers, but the following statement by MacCormack is especially pertinent: "The outbreak of cholera

¹ Mr. Smyth, who conducted his tests by means of an aspirator—the only true method—advances the assertion that the amount of ozone in the atmosphere of the country is almost absolutely constant. (*London Med. Times*, March 9, 1867.)

in the town of Sligo, where it raged with unparalleled severity, was preceded by a terrific storm of thunder and *lightning*, and this occurred also in several other districts throughout the country" (Ireland in 1832). (*Cholera*, 1853.)

The oxygen given off by vegetation, being in the form of ozone, forests have been regarded as largely instrumental in the production of this body in nature. Hence those living near, or in, forests should be specially free from the ravages of these diseases. That this is not true of the Indians of modern times, is well known; that it was not true of them formerly is shown by the fact that during the years 1617, '18, and '19, a fearful plague, whose nature is unknown, prevailed among the tribes of New England: "They died in heaps as they lay in their houses. In the place where many inhabited there hath been but one left alive to tell what became of the rest; the living being, it seems, not able to bury their dead. And the bones and skulls made such a spectacle that as I travelled in that forest near the Massachusetts, it seemed to me a new found Golgotha." (Norton, *New England Canaan*, 1637.)

High hills generally, and elevated plateaus and mountains always, furnish abundant ozonic reaction, and should hence be free from these epidemics. "The plague in 542, and in subsequent periods of the fifty years plague of Evagrius, ascended to the tops of the hills and mountains. Hildanus informs us that in the plague of Lausanne, in 1613, the huts of the peasants on the hills and mountains were not exempt, though detached and having no intercourse with the infected." "The same fact is recorded of the plague of 1720, which extended to the villages and mountains of Provence." (Webster, *op. cit.*) The citadel of Bellary, on a barren hill 500 feet high, with no marshes near, has had "permanent and unrelaxed severity" of cholera since 1818. (Prof. Peters, *N. Y. Med. Journ.*, Aug. 1871.) Of the epidemic of 1854-5, Dr. Terry states: "In both Venetia and Lombardy, the country suffered more than the cities, and the principal routes of the disease were along the high lands." (*N. Y. Med. Journ.*, 1866.) In the epidemic of 1849-50, nearly all the cities upon the elevated plateau of Mexico were affected. (*Ibid.*) "Cholera arises on the *tops of mountains*, and in the bowels of the earth; in hot climates, and in *cold climates*; wherever, in fact, man is, there may this disease be found." (Da Costa.) Islands, being constantly surrounded by an atmosphere highly charged with ozone, should sustain entire immunity from this class of diseases. But I think statistics show clearly that the poison spreads as rapidly, and proves as virulent, here as on the main land, and that the relative frequency of visitation, among various groups of islands, depends entirely upon their degree of isolation. Cholera shows itself "upon *lofty mountains*, in the midst of sandy deserts, and among the scattered inhabitants of thinly peopled agricultural districts. It crosses mountains, deserts, and *oceans*." (*Wood's Practice*, vol.

1, p. 811.) In support of this statement may be mentioned the striking fact, which even Pettenkofer, though holding the "ground-origin" theory, was compelled to admit, that cholera has appeared occasionally on board ships at sea, under such circumstances that the occurrence could only be explained by supposing the germs to have been borne through the air from the far-distant land. (*Med. News and Library*, Oct. 1873.) Epidemics of *yellow fever* always originate in sea-port towns; and the specific poison of this disease "is sometimes generated in ships at sea." (*Flint's Practice*, p. 947.) Dr. Chauffard, of Paris, says of *typhus fever*, that on the high table-lands of Mexico, it is both endemic and frequent. (*Revue Scientifique*, 1873.)

If ozone can ever be detected in any part of a city, it will be in those parts which are most elevated, cleanest, and best ventilated; and these portions of a city should, according to the ozone theory, always be most free from disease; especially when contrasted with those portions which are low and filthy. That the higher portions of a city are exempt from these epidemics is, as a rule, true. A single exception, however, will prove fatal to the view that this immunity is due to ozone. "In the *Traité de la Peste*, p. 29, it is asserted that in the melancholy plague at Lyons, in 1628, the filthiest houses, the crowded places, narrow streets and confined apartments, were places of the most safety; while the most airy situations, as houses on hills, were most exposed to ravages of the disorder." "Malouin declares that the most populous and dirty places in Lyons and Marseilles were least affected with the plague." (Webster, *op. cit.*) In 1847, Constantinople was attacked by an epidemic of cholera. The upper portion, Bosphorus, clean, salubrious, and inhabited by wealthy families and retired merchants, escaped; while the lower portion, Stamboul, with its narrow streets and alleys, abounding in poverty and dirt, was devastated. But eighteen years afterward, clean Bosphorus was decimated, while filthy Stamboul escaped. According to Dr. Drake, the clean and dirty, and the high and low places of Cincinnati were alike affected in the epidemic of 1832. At Nashville, in the epidemic of 1849-50, it "singled out the very summit of College Hill for its onslaught;" and during the summer of 1873, "high places and low places were alike assailed." "It loved the high places and the clean places." (*Nashville Journ. Med. Surg.*, Aug. 1873.)

These examples, which I have selected from those met with here and there in my reading, show that neither the spread of a zymotic disease, nor its virulence, is influenced perceptibly in any way by the presence or absence of ozone. For we have epidemics attacking, with equal severity, the high and low, and the clean and filthy, portions of a city; spreading to the villages upon hills and mountains; depopulating the Indians in their native forests; decimating the inhabitants of sea-girt islands; and, finally, even originating, or breaking out, on board ships at sea. Moun-

tains and islands always furnish abundant ozonic reaction, while forests and seas are great manufactories of ozone.

But lest any should be so uncandid as to deny the conclusiveness of these facts, on the ground that no tests were actually made, and that therefore ozone *might have been absent* in these various cases, I have made "assurance doubly sure" by collecting instances where this proof is furnished. The properties of ozone being always the same, if it exists with, but does not destroy, the germs of disease to-day, it did not destroy them yesterday, and it will not destroy them on the morrow. Hence a single well-authenticated instance of the coexistence of ozone and cholera, for example, would be sufficient, logically, to refute the theorists. But I will be more generous; I will give more than one, and will then assure them that the line might almost stretch out indefinitely.

Prof. Peters, of Lexington, Ky., informs me that he made ozonic observations during the epidemic of cholera in 1851, and arrived at the conclusion that there was no proof of any relation between the two. During the epidemic at Munich, in 1854, Seitz found "no relation." "In August, with a large amount of ozone, this disease increased from day to day; whilst in September, with a small amount of ozone, it decreased." (*Catarrh and Influenza*.) Of the same epidemic Dr. E. Bæckel, of Strasburg, writes: "The minimum of ozone does not coincide with a maximum of cholera, and this last does not diminish as the ozone augments." (*De l'Ozone*, 1856.) During the epidemic at Turin, in 1867, Father Denza made observations a half mile from the town, and found that "during the days in August and September, when the cholera was at about its height, the amount of ozone present was variable, but considerable; perhaps about the average." (*Med. and Surg. Rep.*, May, 1868.) "Dr. Day, of Geelong, assures me that he suspended ozonoscopes around the houses of patients suffering from cholera in 1865, and noted an abundant reaction." (Fox, *op. cit.*, p. 131.) Dr. Macnamara, in his work on cholera, writes:—

"With regard to the supposed influence of certain states of the atmosphere, having reference to the amount of electricity and ozone it may contain, in the generation of cholera in the human body, all such ideas are purely hypothetical. We have no evidence at all in favour of such views."

"A number of pamphlets have appeared, regarding the supposed relationship between cholera and ozone; at Munich, by Pettenkofer; at Königsberg, by Schiefferdecker; at Vienna, Cracow, at Szegedin, in Hungary, at Senftenberg, in Bohemia, at Kremsmunster, etc. They are all unfavourable to the hypothesis that ozone descends below its summer minimum during an epidemic." (Fox, *op. cit.*, p. 135.)

Prof. Kemp, who made observations at Olivet, Mich., for three years, writes me: "I never could discover any relation between ozone and any special type of disease." Mr. Fox is my authority for the statement that during the epidemic in London, in 1854, Mr. Glaisher had ozonometric observations taken throughout the city, and was astonished to find that

where there had been no ozone, there had been no deaths from cholera; but that where ozone had manifested itself, there the cholera had been most active.

Andrews says :—

"It has been asserted, for example, as the result of observation, that an outbreak of cholera is accompanied by a marked diminution of atmospheric ozone; but this statement has been disproved by later and more trustworthy observations. On the whole, it may be safely asserted that no connection has yet been proved to exist between the amount of ozone in the atmosphere and the occurrence of epidemic or other forms of disease." (*Nature*, March 12, 1874.)

My notes furnish many other similar results of observations on the relation between ozone and cholera, but those already given will suffice. As to other diseases, few observations of any kind whatever have been reported. At Nottingham, in 1848, E. J. Lowe observed ozone "to be in excess during months in which an epidemic of *smallpox* was most virulent." (Fox.) Dr. Grimshaw found "no correspondence between the amount of ozone in the atmosphere and the prevalence of *typhus*." (*Med. Surg. Rep.*, Aug. 11, 1866.) If ozone destroys *malaria*, as some have asserted, it seems a little curious that this miasm should exist in the country, where there is ozone, but should never enter the city, where there is no ozone. Prof. W. K. Kedzie, who made observations near Lansing, Michigan, for three years, in a decidedly malarious region, informs me that he never found ozone absent for more than two days at a time. "Ozone and malaria can coexist; of this my experiments have left no doubt." (W. W. Ireland, *Edin. Med. Journ.*, July, 1858.) Mr. Fox states that ozone passed through a solution of the organic matter of marsh air, does not decompose it; and quotes from Burdel to the effect that he frequently found as much ozone over marshes as in other situations. (*Recher. sur les Fièvres Palud.* 1858.) And the same gentleman, after examining the subject very carefully, thus concludes: "There is no evidence to show that ozone destroys the marsh miasm, or is in any way related to malarious disease." (*Op. cit.*, p. 147.)

In considering the relation of ozone to disease, I have endeavoured to devote to each division of the subject as much space, relatively, as its importance has seemed to demand. The remedial effects of ozone have attracted little attention and gained little credence. Comparatively few have advocated the theory of its acting as the exciting or predisposing cause of disease. But in the minds of many practitioners there exists an indefinite, half-formed idea that ozone destroys the specific poison of zymotic diseases; or, in other words, that the absence of ozone is the cause of the production or propagation of these diseases. Therefore I have devoted considerable space to the discussion of this part of the subject. The prevalence of this idea, and the extreme to which some have carried it, cannot be regarded, however, as proof of its truth. There exists in every mind a natural desire for some solution of the mysteries

connected with epidemics : plausible hypotheses have always been readily received by the public, which ever, as Bacon says, "loves better to believe than to examine;" and it is notorious that when once the mind has become impressed by a new and strange object, it takes pleasure in ascribing to it properties which it does not possess, and which are often absurd. To get a more exact and full expression of opinion on this subject, than I had been able to obtain by examining the various journals, I instituted a correspondence with a large number of scientific and professional gentlemen living in various parts of the country. As a result of this correspondence, I find that many of these gentlemen, especially those who have not made any observations, still hold the question *sub judice*; but that those who have tested the matter and have formed an opinion, with one exception only, hold that there is "no connection" between ozone and disease.

CONCLUSION.—When I commenced the study of this subject, I was biased in favour of the view that ozone could produce disease directly by its presence, and indirectly by its absence. But after a careful and candid investigation, I think this view entirely erroneous. Reasoning *a priori*, from the premises furnished by what I found known of ozone and of epidemics, did not result in a conclusion favourable to any such hypothesis; while a resort to recorded observations proved no more satisfactory. It is true that occasionally, in some circumscribed locality, the fluctuations of an epidemic have seemed to sustain a certain relationship to the fluctuations in the amount of ozone; but such an exception proves nothing. In truth, it would be strange if such a coincidence did not sometimes occur; for, by a well-known law, a parallelism must exist, now and then, between two independent and irregular curves.

In the relation of ozone to disease, that which accords perfectly with the known properties of ozone, which harmonizes with the results of all observations, and which at once challenges rational belief, seems to be simply this: *ozone influences the general health, only in so far as it purifies the air by destroying*—not the living germs of disease, but—*the products of decomposition*. Beyond this, all views concerning the action of ozone, as a cause, a remedy, or a preventive of disease, rest upon vague and unfounded hypotheses.

192 E. STATE ST., COLUMBUS, OHIO.

ART. VIII.—*On the Use of Chloral in Cases of Phthisis.* By FRANCIS L. HAYNES, M.D., of Philadelphia.

DR. WATERS and others having called the attention of the profession to the value of chloral in ameliorating the sufferings of consumptives, it is thought that a record of experience on this subject might not prove uninteresting.

I have given chloral with two indications—(1) in small doses to allay cough, and (2) to procure sleep, and thus relieve one of the most distressing symptoms of a peculiarly distressing malady.

1. In giving chloral to allay cough, I have perceived no beneficial result, and now never use it as an ingredient of "cough mixtures." In the following cases, the drug was given alone, in the dose of five grains dissolved in a teaspoonful of simple water, and repeated (except in the third case) four times in twenty-four hours. In all the cases, the amount of coughing was much more than was necessary to expel the secretions. In no instance was the patient informed of the purpose for which the chloral was exhibited.

CASE I.—Margaret M. (apex of left lung solidified) took chloral for thirteen days, during which time her cough became more troublesome. When the chloral was discontinued, no change ensued in the cough. During the period in which she used it, she thought she slept rather better than usual.

CASE II.—Sarah G. (confirmed phthisis) used chloral for sixteen days. It had no effect on her cough, but made her sleep somewhat better.

CASE III.—George C. (slight solidification of right apex) was ordered to take five grains of chloral just before arising, as his cough was especially troublesome in the morning. He used it for three days, and then discontinued it, as each dose caused nausea and vomiting. The cough became less severe, but it still continued to improve when the chloral had been stopped.

CASE IV.—Charles S. (incipient phthisis) used chloral for twelve days. No benefit resulted, nor was there any aggravation of the cough when the drug was discontinued. During its use he did not sleep better than usual.

CASE V.—David C. (cavities in both apices) used chloral for thirty days. The cough continued to grow worse. He thought he slept better while using the chloral.

CASE VI.—William S. (both apices solidified) used chloral for five days. There was no change in the cough for the first three days; during the remaining two it grew more troublesome.

2. But it is in removing the sleeplessness of the last stages of phthisis that we find the true province of chloral. In the earlier stages of a disease which is commonly of such long duration, I have not considered it advisable to teach the patient to rely upon any hypnotic, and hence have not prescribed chloral. The danger of producing chloralism is an additional reason against its persistent use.

When, however, the patient has become so prostrated as to be forced to

keep his bed ; when he is unable to obtain natural sleep, passing and nights in coughing, it is the duty of the physician—all hope of prolonging life being lost—to alleviate his sufferings as much as possible ; and he can accomplish this in no better way than by giving him each night a few hours of sleep. The following are instances of this application of chloral. In each case the disease was far advanced.

CASE I.—Thomas G. has slept scarcely any for months ; his cough is especially troublesome at nights. *March 28.* Slept eight hours last night after receiving gr. xv chloral. *29th.* He received no chloral last night, and slept only about an hour ; feels wretched this morning. While he continued under my observation (one week) the chloral was repeated nightly in the same quantity, with the effect of procuring from three to seven hours of refreshing sleep. Except during sleep, his cough was as troublesome as ever.

CASE II.—Charles S. came under my charge during the last two weeks of his life. Chloral in half-drachm doses, given at bedtime, invariably procured him from six to nine hours' sleep, and had not the slightest bad effect.

I have frequently given chloral with the hope of removing some of the slighter ailments so common in phthisis, such as the dull frontal or occipital headache, but never with success ; when sleep passed away, the pain would still continue.

CASE III.—Catharine S., *March 29*, has been troubled with dull frontal pain all the afternoon and evening. Take gr. xv chloral. *30th.* Slept very much better than usual, but the headache remains. Whenever she awoke during the night, she felt it.

Occasionally chloral is rejected by the stomach ; or, the morning after taking it, the patient feels heavy and stupid. With these exceptions, I have noticed no bad effects from its use.

After chloral has been administered for one or two weeks, its hypnotic action becomes less marked, and it is necessary to increase the dose. It has this disadvantage, however, in a much smaller degree than opium.

In marked cases of insomnia, chloral should be given in doses of thirty grains, repeated if necessary at intervals of two hours. The same effect will be produced by half this quantity, if in conjunction we give ten grains of sodium bicarbonate.

ART. IX.—*Case of Osteophytic Inflammation of the Right Radius : Resection ; Preservation of a Useful Hand.* By B. J. D. IRWIN, M.D., Surgeon and Brevet Colonel U. S. Army. (With a wood-cut.)

WHILE on duty at Fort Riley, Kansas, I was called in consultation, July 25th, 1873, to see Mrs. H——, aged 27, born in New Orleans, a tall, well-developed physique, fair complexion, blue eyes, light-brown hair, and of nervous temperament.

History.—Until recently has been a professional actress—was married and gave birth to her first child during the thirteenth year of her age. Is free from constitutional taint, but has been a sufferer from oft-repeated attacks of articular rheumatism of an inflammatory character, for several years, resulting in considerable enlargement of the knee-joints; the functions of the right knee having become gradually and seriously impaired. About nine months ago had a violent and protracted attack of the malady; the knee and wrist-joints suffering the brunt of the disease, which, after some weeks, assumed a subacute or chronic type.

Some three months subsequently the character assumed by the disease, involving the right wrist, would indicate that at about that period symptoms of periosteal inflammation were manifest, and shortly thereafter the soft parts situated over the inner and dorsal aspect of the distal half of the radius suppurated, leaving a foul intractable ulcer, which has continued since then to enlarge and suppurate profusely.

The system appears to have interposed but feeble resistance to the destructive tendency of the disease, as, within the last few days, two gangrenous sloughs, each about an inch in diameter, have destroyed the tegumentary and muscular tissues in the line of the long axis of the radius.

During the progress of the disease the general health of the patient was seriously depressed, and the constant pain induced a resort to the excessive use of opiates, which caused considerable disturbance to the organs of digestion. Sleep was seldom obtained except by the aid of narcotics.

Upon making an examination, I perceived at a glance that the disease had involved the osseous structures and that necrosis had taken place, which conditions were verified on introducing a probe to the bottom of the ulcer. The patient stated that hitherto no exploration had been made, and that she was then *en route* to an eastern city for the purpose of having the arm amputated, in accordance with the advice of her former medical attendant. The result of my examination convinced me that such an extreme measure was unnecessary; and as the woman was naturally very anxious to save the hand if possible, I advised resection of such portions of diseased bone as might be found involved, as a means to meet the desirable result, believing that the ulna and the contracted cicatrix would ultimately form a good support for the hand.

Having been requested by the attending surgeon to perform the necessary operation, directions were given to prepare the patient by a few days' rest, aided by a generous diet and a moderate amount of wine; and to facilitate the separation of the sloughs, charcoal and yeast epithems were applied twice a day.

July 31, 11 o'clock A. M. Having satisfied myself that the heart was free from organic disease, anæsthesia was readily induced by the administration of a mixture of equal volumes, in measure, of sulphuric ether and chloroform. I then made an incision about five inches long, extending through the diseased tissues down to the bone, from the proximal end of the scaphoid bone to a point about five inches on the inner aspect of the radial bone of the forearm. Upon carrying the finger to the bottom of the incision, from three to four inches of the radius were found denuded of periosteum, and the substance of the bone enlarged by osteitis and osteophytic deposits. By using the handle of the scalpel and the finger, the soft parts were carefully pushed aside and protected from injury by a pair of metallic retractors. The curved end of one of the retractors having been passed under and round it, the bone was divided about a line or two above

the diseased part by the convex edge of a Hey's saw, and by manipulating the free end as a lever, it was easily detached from its articulation. The ulna and carpal bones were found free from disease. By this procedure the division or injury of vessels or tendons was avoided. I was assisted in the operation by her attending physician, Dr. T. G. Horn, and also by Dr. Jones, of Junction City, the former of whom was assiduous in his attentions and efforts to consummate the object of the operation. The upper portion of the wound was reunited by silver sutures, and the granulated surfaces approximated by means of adhesive strips passed from behind and made to decussate over the line of the incision. The wound was then dressed with carbolized glycerine and the limb supported on a suitable splint. Potassium bromide was ordered as a substitute for the narcotics hitherto in use. Beef essence, poached eggs, milk and light wine ordered as diet.

August 1, 12 M. Patient passed a comfortable night; did not sleep much, but feels tranquil and much relieved in having passed through the trying ordeal, the fear of which had caused severe mental anxiety prior to the operation.

Wound looks well. Where it was practicable to use the sutures, union has taken place. A slight erythematous blush extends half way up to the forearm. Removed sutures; ordered a small piece of ice applied on the outside of the dressing, and continued previous treatment.

2d. Feels much better, having enjoyed a fair amount of sleep. The erythema has disappeared; pulse 90.

3d. Continued improvement. Wound granulating nicely. Tendency to diarrhoea during the night, owing, doubtless, to the ill-effects of the effluvia from the wound, which, despite the carbolized dressing applied morning and evening, rapidly became very offensive, owing to the high atmospheric temperature—85° to 95° F.

4th. Is better; bowels regular. Wound looks favourable. Continue treatment.

5th. Continued improvement. Has a return of her former appetite, and relishes her food.

6th. Does not feel quite so well to-day. Through the misconception of her attendant, the patient has had potassium bromide administered to her at frequent intervals, so that she took one ounce of the remedy since I saw her yesterday. The amount ordered was fifteen grains at bedtime, to be repeated twice during the night, if necessary. The quantity given has produced an extreme degree of lassitude and weariness of the whole body. The patient appears haggard and fatigued, the mouth is dry and the pulse 100, but without any marked increase of the normal temperature. Wound granulating rapidly and looking healthy. Some slight tumefaction on the back of the hand; a piece of ice was ordered kept on the outside of the dressing. Ordered egg-nog and milk-punch in addition to other remedies and extract of conium or hyoscyamus as a substitute for potassium bromide. Her brother, a physician, came to visit and remain with her yesterday, and promises to watch the case carefully hereafter, she having missed certain minor attentions which are not ordinarily obtainable in a hotel or boarding house.

7th. Condition much better. The conium induced a night of refreshing sleep, the best, she says, that she has enjoyed in six months. Tumefaction disappeared from dorsum of hand. Wound discharging freely and granulations looking healthy. Appetite better; pulse 96.

9th. Continued improvement. Put on citrate of iron and quinia and aromatic extract of cinchona.

12th. Patient is able to sit up in bed and hold the disabled arm with the other hand. The wound continues to granulate satisfactorily, and all traces of the old sloughs have disappeared. Appetite good; sleeps well, and is cheerful. Ordered a bandage of mosquito netting applied, so as to crowd the tissue during the formation of the cicatrix.

20th. Has continued to improve. Wound nearly healed. A small superficial slough formed and separated four days ago. The felt splint, applied to support the arm while suspended in a sling around the patient's neck, has become limp and soft by moisture, allowing the hand to tilt too much to the radial side, causing the ulna to partially slip from its carpal articulation. To remedy this defect the hand was again placed on a light flat splint supported by a handkerchief bandage. The wound continues to diminish, and the patient is now able to get about the house and sit in the open air.

25th. Is almost well, and anxious to return to her family, in the southern portion of the State. The wound has almost completely healed, and the prospects are that the hand in time will be a very useful one and free from any deformity.

As she is now able to be about, her brother returned to his home some days ago, and at my visit on the 30th, I found that she had followed his example, but, in the hurry and anxiety to reach the home circle, had forgotten to discharge even the claims of gratitude to her medical benefactor.

The wood-cut showing the condition and extent of bone removed, is taken from a photograph of the specimen, deposited in the Army Medical Museum.

In excision of the wrist-joint the extremity of the *radius* was excised as early as 1758 by Cooper of Bungay, and subsequently by Moreau in 1794. (Ashhurst's *Principles and Practice of Surgery*, 1871, page 602.) But the removal of any considerable portion of the distal end of the shaft of the bone does not appear to have been recorded prior to the early part of the sixth decade of the current century. The removal of the articular surface or extreme distal extremity of the bones of the forearm, necessary in excision of the wrist-joint, as performed by Cooper and subsequent operators, leaving a sufficient or suitable base upon which to coapt and support the carpal bones, is a measure of almost a totally different character in extent and magnitude. In 1853, Dr. Compton, of New Orleans, resected the bone of the forearm, removing both bones "with the exception of the inferior extremity of the radius;" and Erichsen, of London,



port the carpal bones, is a measure of almost a totally different character in extent and magnitude. In 1853, Dr. Compton, of New Orleans, resected the bone of the forearm, removing both bones "with the exception of the inferior extremity of the radius;" and Erichsen, of London,

states that he *resected* the *whole* radius "with the exception of its articular head, which was sound," but I am unable to give the date of his operation, as it is not alluded to in the copy of Erichsen's work before me. The *entire exsection* of the radius in 1854 by Dr. Carnochan, of New York, demonstrated the feasibility of preserving a useful hand after the removal of the principal supporting base thereof; and, as a sequence to the experience gained by his major operation, we find that, in 1857, the same surgeon excised, "the *lower* four-fifths of the bone" from a female patient, aged 31, who made an excellent recovery, the functions of the hand—the left—being so little impaired that she was able to perform her household duties nearly as well as before the operation. (Vide *American Journal of Medical Sciences*, vol. xxxvi. p. 89, *et seq.*)

Professor Gross, of Philadelphia, excised "somewhat more than the *upper* third of the bone" in 1857, and in 1859 Prof. Choppin, of New Orleans, "resected all *but the inferior* articular extremity of the bone." I have seen it stated that West, of Birmingham, resected a considerable part of the distal extremity of the radius with success, but I am unable to state the exact time and character of his particular operation.

While the whole of the ulna has been removed, with successful results, by Carnochan, Jones, and Williams, and segments thereof, more or less extensive or important, according to the situation and nature of the operation performed, by several other American and European surgeons, I am unable to discover that any extensive portion of the *lower* extremity of the *radius*, beyond that immediately engaged in the formation of the wrist-joint or in close proximity thereto, had been removed prior to the operation of Dr. Carnochan in 1854, and, although extensive portions of the *upper* part of the bone have been removed in several instances, the exsection of any extensive part of the *lower extremity* of the *radius* does not appear to have been performed except in the instances already mentioned.

Since the foregoing was written, I have learned from Dr. Horn that he had seen the patient in February last, at which time she was able to flex and extend the fingers of the hand separately and pronate the arm. Her health he describes as excellent, and states that she used a broom in sweeping the floor to show how well she could use the limb. The wound made by the operation had cicatrized satisfactorily, but the disease manifests some disposition to reappear in the carpus. After her hurried flight, he says, she was allowed to follow the bent of her wayward disposition, and the carpo-ulnar articulation had not been properly maintained in position.

U. S. MILITARY ACADEMY, WEST POINT. NEW YORK, May, 1874.

ART. X.—*Case of Dactylitis Syphilitica¹ in a Child 18 months old.*

By SAMUEL C. BUSEY, M.D., Physician in Charge of Diseases of Children at the Columbia Hospital Dispensary, and one of the Physicians to the Children's Hospital, Washington, D. C. (With a wood-cut.)

SYPHILITIC lesions of the osseous system in young children, though comparatively rare, are just now attracting so much attention that I am induced to record the following case:—

F. M. H., white female, aged 1 year and 6 months, was admitted to the Children's Hospital Dispensary March 10th, 1874.

The following history of the case has been furnished by medical student H. A. Dobson, under whose care the child had been for some months:—

"The grandparents, it was stated, were healthy, so far as is known; mother's father still alive, age sixty; mother died at age of thirty-five of apoplexy; one brother died at eight years, disease unknown; one sister died at age of eight or ten, of diphtheria; one brother alive and healthy; one sister alive, said to have been troubled occasionally with scrofulous swellings (indefinite). The mother of child is now twenty-four years of age; menstruated at the age of fifteen; has been regular since; about ninth year had 'chills,' lasting about three months; never healthy since, though never sick enough to keep her bed. About the age of fifteen had a scaly eruption, accompanied with great pruritus, on head and forehead, extending thence to body. Was under treatment for a long time; always worse in winter than summer. Previous to the appearance of eruption was living in a hotel as chambermaid, and continued up to about two years before eruption. She made up beds of men who, it was said, were afflicted with 'bad disease,' and sometimes assisted in washing bed-clothing. Slept with the other servant girls, one of whom was afterwards suspected as being 'bad.' Married at twenty-one; husband died two years and seven months after of phthisis; suffered with throat for some time before being taken down. Child born twenty months after marriage, fat and healthy, weighing nine pounds, at full term; continued healthy until three months old, when eruption appeared on head; eruption 'scabby with matter,' and soon formed one scab. Began to waste in flesh at this time. Cough commenced at age of six months; continued severe for several months, and recurs now at times. Had severe bronchial affection. At about tenth month had a 'black diarrhœa,' which was very foul-smelling. This brings the case up to August, 1873; child then aged eleven months.

"In August, 1873, she came under my care, being very feeble, emaciated, weighing but fourteen pounds, with a dark diarrhœa, which soon changed to a thin rice-water discharge, with occasional colour of blood, which may have come from straining, as there was considerable prolapsus ani. Stools very offensive, odour permeating clothing and everything in contact with her. She had been treated with syrup of iodide of iron with cod-liver oil. She had considerable

¹ To avoid any further reference to various discussions of this subject, I give the following references: Dactylitis Syphilitica, Fox on Skin Diseases, p. 297; American Journal of Syphilography and Dermatology, Jan. 1871, article by Dr. Taylor; also, Case of, by Wigglesworth, same Journal for April, 1872: a Case of Congenital Dactylitis Syphilitica, same, Jan. 1872, p. 33; Syphilitic Lesions of the Osseous System in Infants and Young Children, by Taylor, American Journal of Obstetrics, May, 1874; Dactylitis Syphilitica, by same, No. 4, Archives of Scientific and Practical Medicine; Grunhut on Hereditary Bone-Syphilis in Children, American Journal of Obstetrics, vol. v. p. 405; Dr. Taylor's article, American Journal of Obstetrics, vol. vii. p. 53, will richly repay a careful examination.

fever, refused food, and had been fed on crackers, bread, potatoes, meat, etc. Extensive bronchitis; the bronchial râles could be heard at a distance of several feet. I placed her on a diet of pure cow's milk, from one cow. Prescribed a teaspoonful of cod-liver oil with lacto-phosphate of lime (Trinder's), three times daily. Gave also a tonic of bark and iron, elixir Peruvian bark with protoxide of iron (Nichols'), half teaspoonful twice daily.

"In two weeks there was slight improvement. Milk had to be forced down the child, but at the end of this time she drank it freely. She continued to mend slowly. The diarrhoea began to lose its foul smell; the bronchial râles began to disappear; teeth began to make their appearance; but not for three months did she seem to gain in flesh. About the last of October the diarrhoea ceased, and she gained rapidly, so that in the last of November she weighed twenty-two pounds, a gain of eight. Since then she has been quite well, with the exception of the bronchial difficulty, which still continues.

"On the 7th inst. a swelling was observed on the metacarpo-phalangeal articulation of the middle finger. The swelling was white and shiny, with a subcutaneous purple tint. It extended toward the carpus on the dorsal aspect of the hand, more than toward the digital extremity. A simple poultice was applied, and as swelling seemed to cause pain, acetate of lead and laudanum as a lotion was applied. On the third day a little tincture of iodine was applied as a counter-irritant, when the swelling on the dorsal aspect of the hand subsided somewhat, but increased on the palmar surface and toward the digital extremity. It was then discontinued. A close examination showed no fluctuation, and, suspecting that the affection was something of a more serious character than was at first supposed, if not syphilitic, the case was sent to the Children's Hospital, and is now under care of Dr. Busey.

"Mrs. H. has been for some time under treatment for the eruption upon her body, which was scaly, and in one spot seemed to be vesicular, as stains appeared upon her clothing. She is improving under the treatment, which is simply: syrup iodide of iron, fifteen minims, three times daily."

At the time of admission the child was fat and fairly nourished, but flesh was flabby, skin white and colourless, had twelve teeth, eight incisors and four anterior molars. Anterior fontanelle was open, but diminished. The tumour, which involved the first phalanx of the middle finger of the left hand, measured two and a half inches in circumference at its largest part near the metacarpo-phalangeal joint, gradually diminished tapering toward the digital end, but not implicating the second phalangeal joint. The corresponding finger measured one inch. The dorsal surface of the first phalanx was of slightly pinkish colour, deepening with a purplish hue on the radial and palmar surfaces; skin shining, tense, with entire effacement of the cutaneous rugæ; apparently painless. The child cries when the finger is handled and firmly pressed; uses the hand but avoids closing that finger upon anything. The forefinger widely separated. The discoloration of the surface was in a measure due to the iodine stains. To the touch the sensation was that of a firm, hard substance, conveying to my mind the idea of bony enlargement. Near the outer canthus of the left eye, immediately anterior to the left ear and on the left cheek were patches of a scaly, colourless eruption. Ordered the mixed treatment, according to Dr. Taylor's formula, as follows: R.—Hydrarg. bichlor. gr. j; potass. iodidi, ʒij; tr. gentian. co., syr. simp., aa ʒij.—M. S.—Five drops three times a day.

March 21. Tumour enlarged upon the radial side of finger, the skin covering the enlargement deep red, no evidence of pointing, but soft and indistinct fluctuation. Incised the abscess, discharged freely sanious pus. Continued the above recipe and flaxseed poultice to opened abscess.

April 1. Abscess entirely well, slight soreness of the integument only marking its former locality. No pain or tenderness; measurement of the

phalanx not lessened; shape and form same; motion of the second joint seems perfect, and the motion of the metacarpo-phalangeal joint apparently only affected by the enlargement of the phalanx; not sensitive to firm pressure.

The following wood-cut, from a paraffine cast by Mr. Dobson, taken after the cure of the abscess, furnishes a very correct view of the palmar surface of the diseased hand.



The mixed treatment with Dr. Taylor's formula was continued in ten drop doses with but slight diminution in the circumference of the tumour until April 21, when to this was added the local application to the diseased phalanx of the oleate of mercury (ten per cent.). Subsequently the improvement was marked, and on May 11, when I last saw the patient, the largest circumference measured one and seven-eighths inches.

The literature of the subject is so recent that it would be presumptuous in me to attempt any review, but as the paucity of the recorded cases must undoubtedly be attributed to the failure to recognize the true nature of the lesion in consequence of the difficulty and uncertainty of tracing the syphilitic contamination, I may be pardoned for calling attention to a single point in this case, involving the question of diagnosis. Where the osseous lesion is marked and the syphilitic contamination readily traced by the coexistence of any one of the syphilides distinctly recognized in the child, or the history of syphilis undoubted in either parents, there is no

difficulty in making a positive diagnosis, but, as in the case reported, where these conditions are not positively made out, and where there are other concomitant data pointing to the scrofulous diathesis, a doubtful diagnosis necessarily mars the symmetry of the case. Doubtless the syphilitic diseases of infancy are more frequently confounded with scrofulous affections than any two distinct classes of diseases, and hence has grown the not unprevalent opinion, first perhaps promulgated by Lugol, that syphilis bears a genetic relationship to struma. In this case the satisfactory progress of the anti-syphilitic treatment adds strong confirmation of the correctness of the diagnosis.

ART. XI.—*Case of Retinal Separation in the Right Eye and Amaurosis Uræmica in the Left, occurring simultaneously.* By ALBERT G. HEYL, M.D., of Philadelphia.

THE following case, although coming under my notice so long after its inception, is still worthy of record, not only on account of its rarity, but also from its illustrating the part played by chronic renal disease in the production of retinal separation and certain amaurotic conditions.

Mrs. E. B., aged 45, married, presented herself on the 2d of June last, at the dispensary N. E. corner of Eighth and Locust, with the following history. She has always been remarkably healthy, never having been confined to bed with sickness, except, when a child, with scarlatina. She has, however, at times suffered from what appear to have been attacks of cerebral congestion; this condition when occurring at the menstrual period has always been relieved by the discharge. During a severe attack of this kind, marked by violent headache, confusion of mind, tendency to vomit, a violent thunder storm, by which she was very much frightened, arose; while sitting in a neighbour's house, whither she had fled for refuge, with her face bowed upon her hands, she suddenly discovered, in momentarily uncovering her eyes, that she was totally blind. Extremely agitated, she was induced by her friends to recline upon a lounge, and soon fell into a doze lasting about an hour; on awakening vision had partly returned in the left eye, and in another hour was completely restored. But in the right eye no change in vision from the time of accident until the present has occurred.

The patient is a short, stout, thickly-set person, with a constantly flushed face; otherwise presenting nothing noticeable; answering questions quickly and intelligently; no evidence of anything like paralysis having existed. Heart sounds normal; no albumen in the urine at the time of examination, but microscopic examination showed the presence of granular casts indicative of chronic renal disease.

On inspection the eyes seemed in every respect to be normal; movements of eyeballs perfect. Irides of a gray-blue colour, dilated each to the extent of two millimetres. Further examination showed the following:—

R. E.—Able to count fingers, held downward and outward at a distance of two and a half feet. Visual field defective except in the portion corresponding to the upper inner portion of the retina. Tension of the ball decreased. Oblique illumination showed a slight cloudy reflex from the vitreous body, and two round blood clots, partially decolorized; they were posterior to the inner lower edge of the lens, lying upon and doubtless proceeding from the corpus ciliare.

Ophthalmoscopic examination showed cloudiness of the vitreous body, floating opacities and a sheet of separated retina like a mass of rugged ice floating hither and thither as the ball was moved.

Upon the surface of the separated retina could with difficulty be detected a number of anastomosing thread-like lines which proved to be degenerated retinal vessels.

L. E.—Vision $= \frac{20}{20}$. Reads Jaeger 7 at about eight inches, but only able to read for a few moments at a time, owing to an irritable condition of the retina. Visual field normal. Tension normal. Refraction emmetropic. Oblique illumination showed nothing abnormal. Ophthalmoscope revealed great sensitiveness to light; media were clear; retinal veins full and somewhat tortuous; the arteries in comparison appeared small. Optic disk and retina somewhat clouded. Rim of the disk not quite so sharply defined as in the normal condition, but still clearly distinguishable.

Such was the history, such the ophthalmoscopic appearances two years after the accident, and in order to obtain a clear but comprehensive understanding of both, let us examine the condition of each eye somewhat in detail.

R. E.—In this eye during what would seem like an attack of cerebral congestion, there was the occurrence of continuous, almost total blindness, and on examination two years subsequently, the morbid changes already named. Of course the retinal separation at once accounted for the ocular disease, and the only difficult thing to understand, is the method by which this was accomplished, and this difficulty is much enhanced from the length of time which elapsed between the accident and her application to the dispensary.

However, we may consider the cause of the retinal separation to have been either an extravasation of blood or an exudation of serum.

1. An extravasation of blood—a hyperæmia of the intra-ocular vessels, consequent on the turgid condition of the cerebral veins and sinuses, produced a tension of the vessels greater than they could bear, and the blood poured forth soon separated the delicate connective tissue between choroid and retina. This view is countenanced somewhat by the existence of the blood-clots observed on the corpus ciliare, which, although much more recent than the accident, still point to a condition favourable to intra-ocular hemorrhage, and further, the existence of chronic renal disorder, so often productive of vessel-degeneration and consequent fragility of the vessel-coats, would add to the weight of this supposition. Retinal separation from extravasation of blood is, however, a very rare condition, so much so that some authorities have doubted its occurrence. Stellwag¹ believes that in some instances it does occur. Bowman² says on this point, "I have no doubt whatever that effusion of blood into the choroido-retinal space sometimes occurs in consequence of a previous diminution of eye tension."

¹ Lehrbuch der Augenheilkunde, s. 218, Wien, 1870.

² London Ophthalmic Hospital Reports, vol. iv. p. 134.

Von Graefe¹ mentions the case of a patient in whom the hemorrhagic diathesis existed, and who, after repeated attacks of hemorrhage into the skin and from the kidneys, was suddenly seized with total loss of vision in each eye; on examination retinal separation in each eye was found, doubtless dependent upon extravasation of blood. I have in addition the notes of a case in which a large blood extravasation with consequent retinal separation occurred from a missile from an air-gun impinging upon the eyeball.

2. An exudation of serum might have produced the separation; and this idea in turn receives confirmation from the fact of the existence of chronic renal disease, so often accompanied by blood changes favourable to serous effusion. There is, however, one difficulty with both of these suppositions, which is somewhat difficult to meet, viz.: How is it possible, in a perfectly normal ball with normal tension, for an effusion, sanguineous or serous, to force asunder retina and choroid? Or, given, two normal eyeballs exposed to an influence equally powerful as we suppose it to have been in the present instance, how is it that, in one we have a temporary blindness produced, in the other an irremediable pathological condition? The only way out of this difficulty would seem to be the supposition, that previous to the accident the right vitreous was fluid and partially absorbed, and thus the way opened for a retinal separation, which would take place provided the proper motive power were furnished.

Let us now briefly consider the temporary amaurotic condition of the left eye. In this eye, it may be remembered, with pre-existing head symptoms occurred sudden total loss of vision, with gradual but perfect return in the space of two hours. On examination of the eye two years subsequent to the accident, nothing abnormal was noted except a hyperæmic and irritable retina. Taking into consideration the pre-existing head symptoms coupled with chronic renal disease, we may without much hesitation refer this case to that class which bears the name of amaurosis uræmica. The same blood changes and the very possible hyperæmia existing in the right eye were also common to the left; owing, however, to a sounder condition of the vessels, and to a more incompressible vitreous, a sudden serous transudation was poured out, which so compressed the retinal capillaries as to produce a temporary anæmia of the retina and the consequent temporary abrogation of function; it may be considered by some that this process was intracranial and not intraocular, but the pathological conditions of the right eye must strongly incline us to the latter views; after a short time, the mental agitation having subsided and absorption of the serum taking place, the capillary circulation was restored, molecular changes renewed, and the function of vision gradually but surely re-established.

Thus it would seem that this case of temporary amaurosis is referable not to a transitory embolism, as in Mauthner's case reported in the July number of this Journal, nor to lack of power in the blood to properly nourish and vitalize the tissues, but simply to the anæmia of the retina

¹ Archiv für Ophthalmologie, I. B. I. abth. s. 370.

dependent upon the mechanical pressure of a serous fluid ; in a word, the views of Traube¹ with regard to the head symptoms in uræmia as being dependent upon acute anæmia of the brain, caused by œdema of the brain tissue, are considered to be applicable to the retina in this case. Rosenstein,² who accepts Traube's views as being applicable to most cases of uræmia, considers the pure uræmic amaurosis with negative ophthalmoscopic conditions as a certain but very rare occurrence.

Hirschberg³ observed a case which he hardly considered as due to a uræmic condition, but which doubtless ought to be ascribed to it, and which in this connection may be quoted : the patient, a full-grown man, after suffering with headache for two days, was suddenly seized with double complete blindness. Besides great weakness and slowness of intellect nothing abnormal was observed. Absolute amaurosis was present except feeble remains of light sensibility ; pupil moderately dilated ; its reaction slow ; under appropriate treatment complete restoration took place on the following day. This case, although having distinctive features, yet bears sufficient likeness to the one described in this paper, to enable us to link them together as examples of the uræmic amaurosis.

One word with reference to the management of this patient : the eye trouble in this case is but an effect of a general disorder, and the intra-ocular lesions, serious as they may be in regard to the usefulness of the patient, are trivial compared to cerebral changes, very possibly fatal to life, which might occur. Such a patient, therefore, ought never to be entirely free from medical supervision ; proper hygienic regulations should be enforced ; the condition of the kidneys as far as possible ameliorated, and the morbid changes dependent on the renal disease combated.

1537 PINE STREET, PHILADELPHIA.

ART. XII.—*Case of Habitual and Excessive Constipation ; Eight Months and Sixteen Days between Fecal Evacuations.* By THOMAS D. STRONG, M.D., of Westfield, N. Y.

M. B., now residing in Sheridan, Chautauqua Co., N. Y., æt. 26, height 5 feet 10 inches ; unloaded weight 125 ; skin pale, and has a waxy look ; tongue clean and pale ; has been habitually constipated from childhood.

The first medical history of him, which I have obtained, is by Dr. Geo. S. Harrison, of Sinclearville, who attended Brooks when two years old for costiveness. His habit then was to go about two weeks without fecal evacuation.

¹ Vide Niemeyer's Practice, vol. ii. page 32.

² Pathologie ü. Therapie der Nieren Krankheiten, 2te Auflage, p. 153.

³ Jahres Bericht der Ophthalmologie, i. p. 363.

Several years later he attended him for diphtheria, and the time was then extended to six weeks. Dr. H. has occasionally seen him, and watched the case to this time, and says the disease has been gradually and steadily increasing.

For the past six years he has been under my observation, and several times been before our Medical Society, where careful measurements and examinations have been made. Most of the medical men of this county know more or less of the case.

In May, 1872, I took the following measurements of him naked:—

Girth—Chest above nipple	. . . . .	34½ inches.
“ at umbilicus	. . . . .	36 “
“ 2 inches above umbilicus	. . . . .	37 “
“ 3 “ “ “	. . . . .	39 “
“ 4 “ “ “	. . . . .	39½ “
“ 6 “ “ “	. . . . .	39 “
“ at lower end of sternum	. . . . .	38 “

Apex beat of heart one inch above nipple, and one and a half inch inside.

March 18, 1874, I took the following notes:—

Four weeks since he had a partial evacuation. Five months before had a complete evacuation.

Girth at umbilicus	. . . . .	37½ inches.
“ 4 inches above umbilicus	. . . . .	38½ “
“ 6 “ “ “	. . . . .	38½ “
“ at epigastrium	. . . . .	38 “
“ at nipple	. . . . .	36½ “

Dr. G. B. Bishop, of Silver Creek, who is now B's medical adviser, wrote me May, 7, 1874: “His bowels have moved a little several times since you saw him at my house March 14.”

Once or twice a year he has an attack of vomiting, attended with violent pain in stomach and bowels. In 1872 he had such an attack, which was controlled by hypodermic injection of morphia; and, again, in 1873, the same occurred, and bowels were completely evacuated.

The process of defecation lasts two to four days, at which time he is sick, and becomes much exhausted.

The dejections look like brown paper chewed (paper wads of schoolboy days).

There is free escape of gas per anum.

The weight of fecal matter at one dejection was approximately obtained. He was accidentally weighed just before the movement, and again as soon as he could get to the scales. The difference was forty pounds.

The longest interval between any fecal discharges occurred four years since, and was *eight months* and *sixteen days*.

He is a labourer, and does considerable light work on a farm. His abdomen, when loaded, is hard; the diaphragm crowded high in the chest; the colon immensely distended, and traceable like a huge sausage.

He has been under the care of many physicians of all kinds, both intelligent and otherwise, and every imaginable treatment, followed by no permanent benefit.

P. S. Since writing the above report, Dr. Bishop writes me that he has pursued a course agreed upon by us last spring, and has given to B. the elix. cinchona, iron, and strychnia, with occasional small doses

of calomel. The result has been evacuations at short intervals, so that he has diminished in size materially, and his general health is improved. His girth, June 1, was at superior spinous process, 35 inches; at umbilicus, 35 inches; at epigastrium, 35 inches; apex beat of heart natural.

[Numerous cases are on record of very long-continued constipation, but the one above reported by Dr. Strong is, we believe, with a single exception, to be presently noted, the longest well-authenticated one hitherto recorded. Many such cases will be found related in the different medical cyclopædias, dictionaries, and journals, but we will refer merely to a few of the most remarkable.

Dr. Franklin Bache relates (*North Am. Med. and Surg. Journ.*, vol. vi., p. 262) a case which continued for seventy-six days, and afterwards recovered. Dr. Baillie records (*Trans. of a Society for the Promotion of Medical and Chirurg. Knowledge*, vol. ii., p. 174) one which was prolonged for fifteen weeks. Staniland (*Lond. Med. Gaz.*, vol. xi., p. 245, and *Am. Journ. Med. Sci.*, May, 1833, p. 232) another for seven months. Several cases are related by Dr. John Crampton (*Dublin Hospital Reports*, vol. iv., p. 303, and *Am. Journ. Med. Sci.*, November, 1827, p. 194) in which constipation continued for very long periods; in one case it had persisted for eight months at the date of publication, how much longer it continued we are unable to ascertain. An instance is related by Dr. L. Valentin, of Nancy (*Bull. des Sciences Méd.*, t. x., p. 74, and *Observ. des Sci. Méd.*, May, 1825, Marseille), in which constipation continued for nine months.—EDITOR.]

ART. XIII.—*Two Cases of Bi-lateral Lithotomy.* Reported by WM. MAY, M.D., of Washington, D. C.

CASE I.—H. B., aged 35 years. For the past four years has been suffering from vesical trouble; is now extremely emaciated, weighing but 104 pounds. For the last four or five months has not been able to leave his room, and for many weeks past has been confined almost entirely to his bed. Has nearly constant desire to pass water and very great suffering in voiding it. In fact the pain is so great that his physician keeps him nearly all the time under the influence of opium. Urine extremely offensive, and loaded with a most abundant muco-purulent deposit. From the appearance of pus in the urine and its great fetidity, and the extreme emaciation, fears were entertained of ulceration of the bladder. In short, symptoms are all of the most unfavourable nature.

On the 16th of January, 1873, my father, Dr. John Frederick May, of Washington, was requested to visit him by his attending physician, Dr. Jos. Borrows. He had been previously seen in consultation with Dr. Borrows by Dr. Bulkely, who had detected a calculus. On sounding him Dr. May confirmed its existence, but finding his condition for an operation so unfavourable he endeavoured to improve it preparatory to cutting him. After a trial, however, of two weeks, with but little gained, it was decided to give him the only chance left for his recovery, and accordingly, on the 1st of

February, Dr. M. operated on him by the bi-lateral method. After making the section through the prostate, the stone was immediately seized and extracted at the first effort with the forceps. It being, however, soft, and a portion of it crumbling under the pressure of the forceps, several pieces were taken away with the scoop, and the bladder was very thoroughly syringed. The calculus was a triple phosphate very nearly round and one and a half inches in diameter. The patient commenced to improve immediately after the operation, and the wound was very nearly healed by the 16th of February, at that date only a drop or two of urine oozing from it. He sat up on the 17th, and on the 20th the wound was completely cicatrized, and the urine passed entirely by the natural route.

He rode out on the 22d, and gained so rapidly in flesh that in about two months after the operation he weighed 132 pounds, being 12 pounds more than his usual weight. When the calculus was cut in two a substance resembling yellow wax perfectly defined, and of about the size of a small split bean, was found directly in its centre. The patient stated that some four years before the operation a *homœopathist* had introduced yellow looking bougies into his bladder. They were probably made of some composition of which beeswax was one of the ingredients, and a portion of one of them broke off in the bladder, thus presenting a nucleus for the formation of the stone.

I have thought this case of sufficient interest to be reported from the very rapid recovery which the patient made from what seemed to be a very low and apparently almost hopeless condition for an operation, and also from the rapid cicatrization of the wound, for it was to all intents healed in about sixteen days, a fact which tends to disprove the assertion of those who contend that the closure of the wound is slower after the bi-lateral than after the lateral section. Dr. M. moreover informs me that before adult life he has repeatedly seen the wound entirely close in two weeks after the bi-lateral operation, on patients he has operated on. The nucleus of yellow wax found in the calculus also gives additional interest to the case.

The following is a very unusual and interesting case of the coexistence of a deformed pelvis with an enormous calculus in the bladder.

CASE II.—Mr. T., 50 years of age, very fat, and of large frame, has laboured for six years under vesical trouble. His physician, Dr. W. O'Baldwin, of Washington, has only recently attended him, and, suspecting the existence of a calculus in the bladder, requested Dr. May to see him, who on sounding him at his first visit, in March, 1873, detected a stone. The bladder was so irritable and so contracted from continuous spasm, and the examination consequently so painful, that the patient was put under the influence of chloroform while he was sounded.

The spasm of the bladder was so continuous that scarcely any urine could be retained, and it was constantly dribbling into a bottle placed between his thighs both day and night.

The size of the stone could not be determined while sounding the patient, as but a very limited portion of its surface could be touched, owing to the firm contraction of the bladder around it, and the impossibility to inject and retain the smallest quantity of water in that viscus for even a

few moments. The section performed was the bi-lateral, the double lithotome of Dupuytren being used.

The skin, fascia, and cellular tissue being divided, the knife encountered a hard substance running directly in the median line, having the same direction as the staff, and feeling to the finger precisely like that instrument. It appeared to be grooved, and the operator, at first, mistaking it for the staff, cut upon it, and then, placing the lithotome, as he thought, in its groove, he attempted to guide it in the usual manner into the bladder, at the same time depressing the handle of the staff. The lithotome failing to slide as it should have done, and not being felt on the staff, the operator at once saw that there was some mistake. Bringing back the staff to its former and customary perpendicular position, and then feeling very carefully with the finger, he detected the staff lying immediately behind the seeming staff, which had previously misled him. The instrument had to be now turned slightly to one side on account of its lying so directly behind this obstacle, and, being brought into position, the urethra was slightly opened, the lithotome placed in the groove and readily pushed on into the bladder in the usual manner.

The blades had been set so as to cut nine lines on either side of the prostate, thus leaving a margin of two lines before arriving at the periphery of the gland. Having withdrawn the lithotome, the forceps were introduced, and the stone was after much difficulty seized in their grasp. Even now, the bladder being opened, the great size of the concretion could not be ascertained with the finger, on account of the powerful and permanent manner in which the viscus was contracted over it.

All attempts now to withdraw the calculus (although it was firmly grasped and held in the forceps) were found to be utterly unavailing; the stone would not pass between the rami of the ischia, and stuck there as firmly as if it had been held in a vise. After a number of repeated and fruitless efforts, the extraction of the calculus entire was abandoned, and the crushers were introduced for the purpose of breaking the concretion and extracting it piecemeal. This proved to be a most exhausting and difficult operation, for the stone was of such extreme hardness (being a lithic calculus) that at every piece which was broken off, the whole strength of the operator had to be exerted.

Having taken away pieces to the number of twenty-five, and the operation having lasted a long time, the patient, being very greatly exhausted, was unbound, put to bed, and an opiate administered.

He survived this formidable operation much longer than was expected, dying on the fifth day from the time he was cut.

The supra-pubic operation was in this case out of the question, even if the great size of the stone could have been previously determined; for, as has been before stated, the bladder was in such a permanent and powerful state of spasmodic contraction; that the attempt to inject water proved ineffectual; it being thrown out by the force of the bladder's contraction the moment the catheter used in the injection was withdrawn.

At the *post-mortem* the remaining half of the stone in one solid piece weighing four ounces was extracted, it being found necessary, on account of the malformation of the ischium presently to be noticed, to depress the forceps, thus tearing away the soft parts before it could be extracted through the lower and greater outlet between the bones.

The dissection of the perineum showed the following state of affairs, and proved the impossibility of extracting a stone even of most moderate

dimensions through an opening of such diminished capacity. The ramus of the ischium of the left side ran in a perpendicular line upwards towards the symphysis pubis, instead of following the curve always taken by that bone. It occupied a position running directly in the same manner as the staff when introduced and properly held; it was so placed as to completely cover that instrument, and prevent the knife being entered in the manner which is customary when performing the bi-lateral section. For about half an inch on its anterior surface it was marked by a slight depression simulating the groove of the staff, and it was on this account, together with the extraordinary shape and position of the bone, that the mistake before alluded to of supposing it to be that instrument, was made.

The distance then between the ischii which ordinarily exists in the well formed pelvis was in this case diminished by about one-half.

The stone was composed of lithic acid, and weighed within a few grains of eight ounces troy weight. It was three and a half inches in its long and two and three-eighths in its short diameter.

ART. XIV.—*Case of Double Uterus and Vagina; Division of Vaginal Septum.* By EUGÈNE C. GEHRUNG, M.D., of Denver, Colorado.

THE rarity of this malformation, and the successful operation resorted to, will, I hope, make acceptable the report of the following case.

M. B., single, aged 17 years, menstruated for the first time about the age of 11 years. She consulted me Feb. 9, 1874, for a menorrhagic dysmenorrhœa and profuse leucorrhœa, which weakened her greatly. She also complained of habitual constipation and the passage of coagula towards the close of menstruation, and also of pelvic, abdominal, and thoracic pains.

Miss B. was previously under the treatment of a number of both regular and irregular practitioners, each of whom gave a different opinion of her case. She received no benefit whatever from their treatment.

By a digital examination through a narrow hymen—which scarcely admitted my index-finger—I found a small cervix, continuous with a small and hard body, beyond and to the left of the vaginal wall. My first impression was that I had to deal with a left latero-flexion of an atrophied womb. The same impression was conveyed to the finger by rectal touch; but, on reaching higher up, two similar but larger bodies were found in continuity with the former, and arching right and left with a large sulcus between them. I diagnosed double uterus. The whole organ was retroverted, and the left cornu was found to lean heavily against the rectum. Searching for a second vaginal aperture, I soon discovered a small fold of tissue at the site of the left portion of the hymen, into which a sound was passed, and, with the index-finger of the left hand in the right vaginal division, proved the septum intact up to the ossa.

On substitution—with some difficulty—of the middle finger of the same hand for the sound, I found that on each finger I could balance a complete and isolated neck, with a perfect septum between the fingers. The septum

measured from one-eighth to three-sixteenths of an inch in thickness, and each cervix had a diameter of about half an inch. Probes were passed into both wombs to a distance of an inch and a half, but could not be brought into contact; on the contrary, they diverged.

The point of union of the two uteri does not exceed half an inch in diameter; their length is about two inches, and the diameter of the body of each is only about six-eighths of an inch. Vaginismus was present to such a degree that examinations or attempts at treatment caused spasmodic pains for several days. The vaginal septum required division for the following reasons:—

1st. To remove the vaginismus.

2d. To remove the cause of the formation of the above-mentioned coagula; and,

3d. For the purpose of cleanliness, and especially the application of a pessary to correct the displacement.

I therefore proposed the division, which proposition was readily accepted and urged by Miss B. and her parents. Consequently, I operated on the second of June, assisted by my friends Drs. R. G. Buckingham and W. R. Whitehead.

Operation.—After complete etherization, the patient was placed in the left semiprone position of Sims, and a Sims' speculum introduced into the right vagina. Traction on the speculum made both vaginal apertures gape, and with a pair of long, straight scissors, the septum was carefully cut. After reaching the cervixes, the scissors were turned towards the Douglas cul-de-sac, and about half an inch more of the septum—which was prolonged in that direction—divided. There was no bleeding, beyond a little oozing. Two small but completely formed cervixes uteri, each with a plainly perceptible os, were now exposed to view. At a subsequent examination during menstruation blood was seen to issue from each os.

After-treatment and Result.—The patient was directed to remain quiet for a few days, to use twice daily an injection of a weak solution of permanganate of potash. The redundant tissue of the divided septum rapidly disappeared, and at the present date there is only a cicatricial elevation to be found at the lines of insertion of the former septum. By the use of a pessary (a modification of Hodge's closed lever), the retroversion was soon corrected, and the patient has had since a daily natural stool. Besides this, the pessary had the advantage of preventing reunion at the upper angle of the cicatrix—if there was any tendency to that present. A few mild applications to the mucous membrane of the cervixes and vagina soon arrested the leucorrhœal discharge. Dysmenorrhœa ceased, the quantity of menstrual discharge has become normal, and no coagula have made their appearance at her menstrual period since the operation. In short, Miss B. is now in perfect health.

I profit of this opportunity to express my thanks for the able and kind assistance rendered to me by Drs. R. G. Buckingham and W. R. Whitehead.

DENVER, July 28, 1874.

REVIEWS.

ART. XV.—*A Treatise on Food and Dietetics, Physiologically and Therapeutically considered.* By F. W. PAVY, M.D., F.R.S.; Fellow of the Royal College of Physicians; Physician to and Lecturer on Physiology at Guy's Hospital. 8vo. pp. 574. Philadelphia: Henry C. Lea, 1874.

UNTIL comparatively recently science could go no farther in analyzing the relations of food to life than this: Matter must be furnished to the living organism first to form the bulk of the growing body; secondly, to make good the loss of substance by the wear and tear of tissue involved in the living state; and, thirdly, to supply fuel for keeping up body-heat. Here theory used to stop, and the student in the domain of alimentation concerned himself only with the practical details of digestion and assimilation. And—alas for the slow spread of knowledge!—even some textbooks of physiology current to-day rest here in their presentment of the purposes of food, content with the meaningless phrase that food is necessary for the nutrition of the body, and the keeping up of animal heat. But of late years a new and far-reaching idea has been developing, which, finally taking the shape of a grandly simple but universal physical law, has now asserted its authority even over the domain of physiology, and forced us to study the phenomena of life from a new point of view. It is that not only is matter never formed *de novo* nor destroyed, but *force* is equally eternal, and its different forms are mutually convertible; that is, just as there is a fixed quantity of matter in the universe (for these fundamental laws stop at no barrier of time or space), so there is a fixed amount of *energy* to be got from the momentum of moving bodies, heat, light, electricity, chemical affinity, etc., and these several forms of force can be turned the one into the other. This beautiful conception is, it is needless to say, what is to-day called the doctrine of the *conservation of energy and correlation of the forces*. Proved beyond question as regards the phenomena of inorganic nature, it has, as just said, lately thundered at the door of the physiologist, and demanded recognition and homage at his hands also. For the living organism is as much a material system doing work, in the large sense of the phrase, as a clock, a windmill, or a steam-engine; and all general laws affecting the interactions of matter and force must plainly apply here as well as elsewhere. The phenomena of life, then, being deeds wrought upon matter, are effected by some form or forms of force, and their doing is attended with expenditure of actual energy, exactly as in case of a machine of wood or iron. Physiology thus has a new problem to solve, to account in mode and measure for the energy used up, or more correctly *converted* in the doing of life-work. And at once a new light breaks in upon us in considering the why for the ceaseless feeding of living things upon outside matter. Life is a display of action; for all action an equivalent of energy is demanded; *chemical affinity* is a force, and *chemi-*

cal union sets free actual energy in available form. What is plainer, then, than that a fundamental purpose of food is to furnish the needed energy for life-purposes *in posse*, in the shape of organic matter ready to undergo chemical recombinations?

At bottom, then, at least so far as the adult animal is concerned, alimentation means the conversion of food-energy into life-work, and the problem has now to be studied from a strictly physical as well as physiological point of view. This has been done, and, during the last few years, what with a better understanding of the laws of chemical dynamics and improved methods of physiological research, our knowledge of food, in its relations to life, has made such strides, that a systematic presentment of the whole subject in English has been a real want. This is the scope of the book now before us, and no higher praise can be given to Dr. Pavy's treatise than to say that until more facts shall be learned, there will be little need of any other writer spending time in covering just the same ground. The work has all the peculiar merits that make the best class of English medical books the best in the world; that is, it is clear and straightforward, not encumbered with masses of irrelevant learning like so many of the ponderous tomes of Germany, but yet dealing with the scientific aspect of its subject with a thoroughness often lacking in the literary efforts of the American "busy practitioner." It is, moreover, no mere compilation; but the author, being himself a student in the path wherein he treads, gives us many facts of his own working out, and commands a respect for his opinions, which the mere bookmaker can never deserve.

The keynote of the book is the relation of food to life-work on the doctrine of the conservation of energy. The work is not divided into numbered chapters, but the topics are dealt with under the following general headings:—

"Introductory Remarks on the Dynamic Relations of Food."

"On the Origination of Food."

"The Constituent Elements of Food."

"Alimentary Principles—their Classification, Chemical Relations, Digestion, Assimilation, and Physiological Uses."

"Alimentary Substances."

"The Preservation of Food."

"Principles of Dietetics."

"Practical Dietetics."

"Therapeutic Dietetics."

Practically the book falls into three parts: the first, a discussion of the physiology of alimentation, including the *rôle* of the different alimentary principles in nutrition; the second, a detailed consideration of food-substances; and the third, a building up of the principles and practice of dietetics upon the groundwork thus laid down.

In the "Introductory Remarks" our author first briefly defines the general idea of the conservation of energy, and then points out the relations of food as the source of vital energy, tracing the power locked up in food to the force of the solar rays. And when we say that these vast ideas are expounded in the short space of seven pages of large print, the reader need not be told that they are dealt with briefly and categorically. We wish indeed that this chapter, containing, as it does, the foundation of the whole superstructure, were five times its present size. Of course, strictly speaking, the fundamental truths of physics and physiology have a right to be assumed in a special treatise like the present; but as they are, un-

fortunately, subjects that the medical man is apt *not* to thoroughly know, Dr. Pavy would have been surer of the intelligent following of his reader had he dwelt on them a little more fully. On the vexed question of whether or not there is a distinct vital "force" or "principle," our author's remarks are very sensible. Waiving fruitless discussion about what determines the occurrence of vital phenomena, he contents himself with pointing out the practical fact that the *forces* actually in play are the physical forces, the *effects* being peculiar on account of the peculiar character of the living machine operated on.

Under the heading "Origination of Food" are discussed the relations of animal to plant-life, and of the latter to the sun. An animal is strictly a system for turning potential energy into actual work, and the source of power is found in oxidizable chemical compounds taken as food. Now matter capable of combining with oxygen under the conditions presented by the living animal neither exists native, so to speak, nor can the animal form such out of inorganic material. Whence then our food? As is well known, it is obtained directly or indirectly from the vegetable kingdom, and the reason lies in the fact that the plant can do what the animal cannot, namely, take the fully oxidized compounds of the mineral kingdom, forcibly dis sever part at least of the oxygen from the combination, and form new products from the residue. These so-called *organic* compounds, containing as they do less oxygen than the associated elements are capable of combining with, possess potential energy, and are available as food. Animal life is thus utterly dependent on vegetable for its maintenance. But in thinking of the peculiar feat of the plant just described, we see that it is in kind the reverse of what is done by the animal. He turns pent-up energy into actual work; his vital deeds are as the falling of the hammer on the cap, the explosion of the powder, and the rushing forth of the ball when a rifle is fired. But the dissociation of oxygen from combination by the green leaf is on the contrary a *storing* of energy—it is the act of loading, capping, and cocking the gun, and stands in reciprocal relation to the doings of animal life. But whence comes the energy thus pent-up by the plant in forming organic products? To carry out our simile, whose hand is it that rams home powder and ball, and draws back the hammer? The sun's—the actual energy contained in the solar ray is the power which, by means of the green leaf as the instrument, overcomes chemical affinity, tears out part of the oxygen from carbonic acid, water, and ammonia, and hides itself like the charge in a gun in the reoxidizable compounds resulting from the chemical break-up. Thus all vital action has its final source in the sun's light and heat; and, looking at life in general, we see the following cycle of changes. As regards matter, inorganic is changed to organic by the plant, a process involving deoxidation; and organic is reconverted into inorganic, or started on the road thereunto, by the animal, through reoxidation of vegetable products taken as food. As regards force, the actual energy shot forth by the sun is converted into potential chemical energy in the formation of deoxidized compounds in the plant; and potential chemical energy reappears as actual when these products are reoxidized in the animal, being reproduced as heat, muscular motion, nervous, secretive, or formative action, etc. Thus in every way plant-life and animal-life are reciprocal in action. The setting forth of these fundamental truths is the theme of the chapter under consideration, and our only criticism thereupon is to suggest that our author in his next edition lop off three million miles or so from his stated distance of earth

from sun. Astronomy no more stands still than physiology, and the 95,000,000 miles solar distance of our school-days is altogether a thing of the past.

The chapter on the "Constituent Elements of Food" is a single page, enumerating the chemical elements entering into the composition of the human body.

The next section on "Alimentary Principles" is over a hundred pages long, and is practically a complete digest of the physiology of alimentation, from the point of view of the relation of each natural group of food-principles to the purposes of life. In this connection many new facts have been worked out of late, which overthrow Liebig's once generally accepted theory of nutrition, and as the new views seem to have hard work to gain even mention in some of our American text-books of physiology, we earnestly advise the careful reading of this admirably arranged chapter, and shall give a fuller abstract of its contents than the purposes of mere criticism really require.

Dr. Pavy very properly classifies foods solely on the basis of their chemical nature, and for study divides them into four groups: "1. Nitrogenous principles. 2. Hydrocarbons or fats. 3. Carbohydrates. 4. Inorganic materials." Taking them up in order, the nitrogenous principles are first considered. These are enumerated, their digestion discussed, and then the important question of the purposes they fulfill presents itself. In general, what life requires at the hands of food is matter for the growth and renovation of tissue, and matter which primarily or secondarily shall yield by chemical transformation the energy consumed in life-work. So far as the first purpose is concerned there is no question of the rôle played by the principles under consideration. The nitrogenized material of the tissues and secretions must of course be derived from the nitrogen-containing principles of food. But as regards the relation of these principles to force-production we have new facts opposed to the formerly accepted view of Liebig. In the technical sense of the phrase, the greatest amount of work done by the living animal requiring the expenditure of measurable energy, is in the form of muscular and nervous action. Of these again, muscular movement is dynamically the greater, and for the purposes of the discussion may be taken as typifying the conversion by animal-life of energy into work. Now Liebig, as is well-known, advanced the theory that the energy consumed in muscular action is derived from oxidation of the muscle-substance itself, whereby, of course, the latter suffers disintegration in proportion to the work done. Such assumed destruction of substance, of course, involves corresponding renewal, and the tissue being nitrogenized, nitrogenous food can alone make good the loss. Accordingly nitrogenized matter is not only of prime importance as the essential building material of the body, but is also indirectly the source of all vital energy. "What wonder then," as Dr. Pavy says, "if with all these purposes to fulfil, the nutritive value of food should have been measured, as it latterly has been, by the amount of nitrogenous matter it contains?" But this plausible theory will no longer stand, for facts now tend to show that the energy put into muscular work is derived mostly from oxidation of non-nitrogenous matter, "the muscle merely serving as a medium for the conversion of the generated force into motor power."¹ The line of argument is as follows:—

¹ A more correct phrase would be "for the conversion of the *liberated energy* into motor work." And, indeed, though Dr. Pavy in his first chapter points out

"Does the force evolved by muscular action proceed from destruction of muscular tissue? If so, nitrogenous matter would be needed to replace the loss incurred, and the result would be equivalent to nitrogenous matter through the medium of muscle being applied to the production of motor power. Now, if muscular action is coincident with the destruction of muscular tissue, there must, as a product of the destruction, be a nitrogen-containing principle eliminated. The elements of the compounds that have served their purpose in the economy do not accumulate, but are discharged from the system under certain known forms of combination. The nitrogen, therefore, belonging to a consumed nitrogenous structure should be recognizable in the effete matters thrown off from the body. Nay, more, as the force developed by muscular action cannot arise spontaneously—as it can be produced only by transmutation from another force—the destruction of muscular tissue (which through the chemical action involved supplies the force), should be in proportion to the amount of muscular work performed, and the nitrogen contained in the excreta in proportion also to the amount of muscular tissue destroyed." (p. 55.)

Urea is the great channel for the excretion of nitrogen, and the amount of this element thereby eliminated so nearly equals the sum of that originally taken in food, that for all practical purposes the urea may be considered as representing the whole of the nitrogen excreted. Now were Liebig's theory true, two things should happen: First, the amount of urea passed should vary with the muscular work done, rising and falling according as the individual exercises or rests; and, secondly, the amount excreted during exercise should express an amount of chemical action equivalent to the energy needed to do the stated quantity of work. But lo! when put to the test of accurate observation and analysis, neither circumstance obtains. Other things being equal, the excretion of nitrogen is wholly unaffected by even violent and prolonged muscular action; and in carefully conducted experiments it is found that in arduous muscular work the energy represented by the chemical action concerned in forming the urea excreted does not begin to be enough to produce the given effect—as Frankland found in Fick and Wislicenus's experiment, equalling only one-fifth of the energy actually consumed. But what *does* turn out to be the case is that the amount of nitrogen excreted varies directly with the quantity of the same element taken in food, and that, too, irrespective of whether the individual exercises or rests. Dr. Pavy analyzes at length the various experiments by which these facts have been obtained. They all tend one way, with the apparent exception of Weston's five-days walk in 1870, in the attempt to make four hundred miles within that time. In this case Dr. Flint, Jr., of New York, conducted the observations, and he claims that the results support instead of controverting the Liebigean theory. We cannot give the space to follow our author's analysis of Dr. Flint's exhibit, and must refer the reader to the book, merely saying that Dr. Pavy shows, as we think, conclusively, that a proper viewing of the results leads really to the opposite conclusion to that drawn by Dr. Flint; for the energy expressed in the urea actually excreted by the pedestrian during the walk, amounts at the most to only one-third of that really expended in accomplishing the work done.

Muscular tissue then does not consume itself as fuel in doing work, and the assumed rôle of nitrogenous food-principles to repair this imaginary

the modern technical distinction between "force" and "energy," he often uses the words in the old way as convertible terms. This is unfortunate, for the subject is in its nature so abstruse that it will not safely bear any loose use of its terminology.

waste has no place in fact. At once two questions arise: first, what then *does* become of the bulk of the nitrogen-containing food in the adult; and, second, what is urea, if only a small percentage of it can be a product of muscular and nervous tissue-metamorphosis? One answer suffices for both: instead of nitrogenous food first becoming tissue, which by work is disintegrated into urea, the tissue suffers but trifling waste, and the great bulk of the nitrogenous food-matter is *directly* broken up into secondary compounds, of which urea is one of the final results. That is, urea is the product of disintegration of *food*-elements instead of *tissue*-elements. The proof is twofold: first, if muscle does not waste in work, the main bulk of urea cannot be anything else than a direct derivative of the food: and, secondly, there is positive evidence that the urea-excretion varies directly within certain limits with the amount of nitrogenous food taken. Dr. Pavy here takes up the important question of the rate of the chemical change leading to the formation of urea, and gives us the results of original experiments performed by his own laboratory assistant. These show that the splitting up of the nitrogenous food-principles into urea and other compounds takes place promptly, a decided rise in urea-excretion occurring within three hours after a hearty meal on animal food following a previous non-nitrogenous diet.

The next question is, does this metamorphosis of nitrogenous matter subserve any useful purpose? The *urea* formed is plainly a waste product, but comparing its percentage composition with albumen, as the type of the nitrogenous substances out of which it comes, it is found that assuming the urea to contain all the nitrogen of the albumen, it can represent but one-third of the whole bulk of the original material. When albuminous substances, then, break up and urea is formed, there must always be left a residual non-nitrogenous portion equal to two-thirds of the original mass. Moreover this latter compound, though containing some oxygen, has carbon and hydrogen present in excess. It is then still an oxidizable material, and therefore represents potential energy, like fat, starch, or sugar. And deducting the energy carried off unutilized in urea, the quantity remaining to be actually obtained from albumen is about half that yielded by an equal weight of fat, but is somewhat greater than that afforded by sugar or starch. As to the form and actual physiological history of this residual compound of albumen, it is possible and even probable that it may appear as fat, but positive proof is wanting.

As regards *gelatinous* principles, while their power to form tissue is doubtful, there is no question that, like albuminous substances, they split into urea and an oxidizable, and therefore energy-containing residue; for "the elimination of urea is augmented by the copious ingestion of gelatin, just as happens in the case of the protein compounds." (p. 96.)

Coming next to the non-nitrogenous group of principles, our author begins:—

"While nitrogenous matter may be regarded as forming the essential basis of structures possessing active or living properties, the non-nitrogenous principles may be looked upon as supplying the source of power. The one may be spoken of as holding the position of the instrument of action, while the other supplies the motive power. Nitrogenous alimentary matter may, it is true, by oxidation, contribute to the generation of the moving force, but, as has been explained, in fulfilling this office there is evidence before us to show that it is split up into two distinct portions, one containing the nitrogen which is eliminated as useless, and a residuary non-nitrogenous portion which is retained and utilized in force-production. It is true, also, as will be shown hereafter, that

non-nitrogenous matter may be applied to tissue-formation, but it is probable that, in doing so, it is simply for the purpose of being stored up for subsequent appropriation to force-production, according as circumstances may require.

"The non-nitrogenous alimentary principles comprise—

"1st. The hydrocarbons or fats; 2d. The carbohydrates, starch, sugar, etc.; and 3d. Principles, such as alcohol and the vegetable acids, which do not strictly fall within either of the preceding groups." (p. 97.)

Taking fats first in order, we have their chemistry and digestion briefly discussed, and then at once a consideration of their purposes as aliments. Fat is an element of tissue, and doubtless the greater part of the fat of the body comes from the fat of the food. But, as adipose tissue, fat plays a passive rôle, as a mere non-conductor of heat and convenient form of padding. In this state, however, it "forms a store of force-producing material to be drawn upon as circumstances may require"—as witness the history of hibernating animals. In this connection our author gives us—not a cock-and-bull-story, but a cliff-and-pig story, which, if not as tragic as the famous ballad of the "Mistletoe Bough" which it irresistibly suggests, is yet far more astonishing in its *dénouement*. He was a fat pig, weighing one hundred and sixty pounds, and his home was a six-foot hole with a wooden door dug out of the white cliffs of sea-girt Albion; and a part of the cliff fell and sealed up the pig, living, in his sty, as hopelessly as the treacherous lid of the ancient chest entombed the hapless bride of the old ballad. And one hundred and sixty days afterward, when some workmen were clearing away the rubbish, behold—"a skeleton form [did not] lay mouldering there!" but—a whine from that pig did rend the air, to the considerable astonishment, evidently, of the workmen. They immediately reported the fact to a Fellow of the Linnæan Society, who "urged them to proceed." They did so, and we are told that the scientific gentleman was "surprised," as well he might be, when that pig was shortly unearthed in the flesh, though not in very much thereof, for forty pounds was all that was left of his former goodly proportions. By licking the sides of his tomb for moisture, and by quietly appropriating three-fourths of his own substance as food, he managed not only to support life for one hundred and sixty days, but to win immortality in the Transactions of the Linnæan Society, vol. xi., where the tender tale of his toughness may be found. We feel disposed to ponder on how the story of the "Mistletoe Bough" would have run, had only the giddy young bride been a middle-aged comfortably fat matron, and had the old oaken chest stood in a reasonably damp cellar where moisture could have been had for the licking—but we forbear.

What now of the rôle of fat as a source of energy through direct oxidation in the system? According to Liebig's theory, such primary combustion takes place, but its only outcome is body-heat. But the new departure claims that it is to this source that we must also look for the bulk of the energy consumed in vital action—that hereby, indeed, we get the power formerly erroneously supposed to come from disintegration of the acting tissue-substance itself. The argument is simple. If work-energy come from nitrogenized tissue-metamorphosis, the *urea*-secretion should increase with exercise. It does not. If then the energy come from oxidation of non-nitrogenous food-matter, the elimination of *carbonic acid* should rise with work. And it does, increasing enormously under muscular exercise. Negative and positive proof thus agree, and instead of Liebig's surmise that the nitrogenous tissues are both machinery and fuel, we see that the case is really more like that of an ordinary engine. The

structure itself suffers only the inevitable wear from work, and the power comes from an independent burning of fuel—from the primary oxidation of non-nitrogenous matter. But here we must not go too far, and think that fat, eaten as food, is the only source of this fuel. All oxidizable matters answer the purpose to the extent of their mechanical equivalents, and therefore we must include, among sources of energy, the other non-nitrogenous food-principles, as well as that non-nitrogenous residual substance which, be it remembered, results from the break-up of nitrogenous foods, and also, it may be here added, from what little disintegration of nitrogenous tissue does occur in the wear and tear of living.

In the matter of the *carbohydrates*, after the usual preliminaries as to chemical composition and digestion, our author points out that the principal members of the group all reach the portal circulation as saccharine matter, and then wholly disappear as such in the liver. Experiments and observations are brought forward to show the probability that this disappearance is due to conversion of the sugar into the amyloid substance of the liver; that this new material is further transformed into fat; that this change also takes place in the liver, but can only occur through co-operation of nitrogenous and saline foods; that the fat thus formed is dealt with like fat originally introduced as such; that moreover the splitting up of nitrogenous food, already described, likewise has its seat in the liver, and that the non-nitrogenous residuum thereby formed passes through the condition of amyloid substance into fat exactly like the carbo-hydrates of food.

From all this it appears that the details of the new theory of alimentation are more complex than in the Liebig hypothesis. And to enable the reader to grasp better what is clear enough as our author sets it forth, but perhaps somewhat confusing in our own condensed abstract, we venture to present Dr. Pavy's conclusions in tabular form, where, reading from left to right, the alimentary history of each of the important groups of organic food principles can be followed. The final derivatives, when useful, are printed in small capitals, when useless, in italics.

Nitrogenous food:—

- | | | | | | |
|----------------|---|--|---|--|--|
| | { | 1. Splits in liver into | { | 1. Nitrogenous portion finally appearing as <i>urea</i> . | |
| | | | | 2. Non-nitrogenous portion, first amyloid substance, then fat: SAME DESTINY AS FATTY FOOD. | |
| A. Albuminous. | { | 2. NITROGENOUS TISSUE: this by slow wear | { | 1. Nitrogenous product finally appearing as <i>urea</i> . | |
| | | | | 2. Non-nitrogenous product (fat?) | |
| | | | | { 1. Fatty degeneration (?)
2. Energy by oxidation { 1. BODY-HEAT.
2. VITAL WORK. | |
| | { | 3. NITROGENOUS PRINCIPLES OF SECRETIONS. | | | |
| | | | | | |
| B. Gelatinous. | { | 1. Splits in liver into | { | 1. Nitrogenous portion finally appearing as <i>urea</i> . | |
| | | | | 2. Non-nitrogenous portion, first amyloid substance, then fat: SAME DESTINY AS FATTY FOOD. | |
| | { | 2. OTHER DESTINY? | | | |
| | | | | | |

Non-nitrogenous food:—

- | | | | | | |
|-------------------|---|--|---|---------------------------------|--|
| | { | 1. Energy by oxidation | { | 1. BODY-HEAT.
2. VITAL WORK. | |
| | | | | | |
| A. Fats. | { | 2. FAT OF TISSUE: in emergency, energy by oxidation. | { | 1. BODY-HEAT.
2. VITAL WORK. | |
| | | | | | |
| | | | | 3. FAT OF SECRETIONS. | |
| B. Carbohydrates. | Saccharine matter by digestion, amyloid substance, then fat in liver: SAME DESTINY AS FATTY FOOD. | | | | |

Alcohol is intermediate between the carbohydrates and fats. In this place its food-value only is considered, and the demonstrations of Anstie, Dupré, and others are accepted as overthrowing the views of Lallemand, Duroy, Perrin, and Edward Smith, and establishing the fact that ingested alcohol is practically wholly destroyed as such within the system. Whence our author very sensibly concludes: "If this be the case, it may be fairly

assumed that the destruction is attended with oxidation and a corresponding liberation of force, unless, indeed, it [the alcohol] should undergo metamorphosis into a principle to be temporarily retained, but nevertheless ultimately applied to force-production." (p. 141.) He further suggests that the subject be studied physiologically, as well as chemically.

A few pages on the *inorganic* alimentary principles completes this long section.

The chapter on "Alimentary Substances" begins the practical part of the book, and covers 250 pages. The various articles of diet, both usual and unusual, are taken up separately, and all information bearing on their use as food is given, including the causes and effects of unwholesomeness, and how to recognize the bad condition. The subject of adulteration, not properly coming within the scope of the work, is not treated of. Condiements, because "not strictly alimentary substances," are dismissed with a mere enumeration, but the various beverages in common use are freely discussed. Speaking first of drinking in general, Dr. Pavy insists that the popular fear of unduly diluting the gastric juice by too much fluid has no foundation in fact, and that indeed much mischief results from the prevalent habit of sipping strong drinks instead of taking goodly draughts of innocent ones. As regards the popular "neurotic" beverages, in these days of difference of opinion, and not always perfectly cool arguing concerning their physiological rôle, one turns with interest to see what each new author says on the subject. Dr. Pavy's account of the action of tea and coffee is far from satisfactory, his conclusions being painfully lacking in precision of statement; an unexpected failing in one elsewhere so severely analytical in method. In the case of tea, after premising that medical difference of opinion on the subject of prescribing tea-drinking, "testifies to the want of some definite guiding principle of action," he gives the following as "an attempt to furnish a concise representation of what is known" as a "basis for greater uniformity of procedure:"—

"Tea forms a light beverage, which is neither heating to the system nor oppressive to the stomach, in which respects it differs from coffee. Taken in moderate quantity, it may be spoken of as exerting an exhilarating and restorative action without stimulating or inebriating like alcohol. By such action it exerts a reviving influence when the body is fatigued, but perhaps some of the effect is also attributable to the warmth belonging to the liquid consumed. It disposes to mental cheerfulness and activity, clears the brain, arouses the energies, and diminishes the tendency to sleep; to such an extent, it may be, in some sensitive persons, as to occasion a painful state of vigilance or watchfulness, and sleeplessness." (p. 341.)

Then after speaking briefly of the symptoms following abuse of strong tea, he goes on:—

"Tea, like coffee, appeases the sensation arising from the want of food, and enables hunger to be better borne. Lehmann was of opinion that it lessened the waste of the body, but Dr. E. Smith asserts that it increases slightly the amount of carbonic acid exhaled, and he thereby speaks of it as promoting rather than checking chemico-vital action. More conclusive evidence, it may be considered, is required in reference to this matter, to show that any decided action either way is exerted." (p. 342.)

Surely Dr. Pavy should give us something better than this; for if tea and coffee have place at all in an essay on food, the vast subject they open up, of the influencing of vital processes in the direction of health by means other than the furnishing either of tissue-pabulum or potential energy, should receive the attention it deserves. But here the only attempt to ana-

lyze such influence is contained in the single line stating that tea exerts an "exhilarating and restorative action without stimulating or inebriating like alcohol." We feel like sighing in despair. Shall we *never* pitch this old-man-of-the-sea "stimulation" off our back, or is he a sort of physiological handycap to be shouldered as a matter of course at the outset of every inquiry into the influence of agents on the phenomena of life? Not that there is any objection *per se* to the word "stimulus," but the trouble is that those who use it never say what they mean by it, expressed in definite physiological terms. Now it is one thing, now another, and the word, therefore, instead of conveying an idea, only serves to perpetuate confusion of thought. Thus, in the case in point, can any more obscure conundrum be put than to ask what is the difference between the "restorative" action of tea which has no food-power, and the "stimulant" influence of alcohol which, on the contrary, *has* a true food-action? Yet such undefined difference is here made the practical key towards an intelligent prescription of the purely "restorative" agent. The analysis of the action of coffee amounts to about the same thing as with tea, except that coffee "exerts a more heating and stimulating action than tea, and increases in a decided manner the force and frequency of the pulse." Here again we have it: coffee to a certain extent "stimulates," that is, it goads or urges on—well, what to do what? Not the heart to beat, for acceleration of pulse is referred to *in addition* to the "stimulation." What then? Echo answers, and his remarks are never worth recording in a scientific journal.

As to alcoholic beverages, the power of alcohol to yield available energy by oxidation was discussed and admitted in an earlier part of the book, and in this place the peculiar effects of the fluid itself upon the system are briefly alluded to. Dr. Pavy surprises us by seeming to lean to the side of those who still imagine alcohol to raise body-heat, instead of lowering it. He cites Parkes and—erroneously—Anstie to that effect. Anstie's quoted observation of a rise of temperature, after alcohol, in a rabbit's ear was rightly interpreted by himself only as showing changes in the *distribution* of heat, in the shape of a determination to the surface from vaso-motor paralysis. But as regards the influence on body-heat in general, Anstie is among those who maintain that alcohol causes a fall of temperature, and we must say that in view of the very large mass of evidence to that effect now on record, we do not understand Dr. Pavy's apparent unwillingness to concede the point. In the matter of alleged repression of tissue-metamorphosis, our author again avoids assenting to the commonly received notion. We cannot find fault with him here, for we think that on this head current arguments need a thorough overhauling. As regards the question "whether the effect of alcohol is to increase or diminish the facility with which work is performed," Dr. Pavy merely quotes, without comment, Parkes's experiment where a healthy, temperate, well-fed, and regularly worked soldier has suddenly added to his dietary *three four-ounce drinks of strong brandy per diem*, with the inevitable effect that he was thereby put out of sorts, and lost his energy and "wind." But in drawing from this result the general conclusion that alcohol "diminishes the facility to do work," we must be careful not to confound different things. Parkes's experiment proves only what has been practically known for centuries, namely, that a healthy well-fed man has no hidden storehouse of strength or endurance which can be unlocked by alcohol; but that, on the contrary, if such a person take suddenly enough strong drink to affect him at all, it will be sure to make him less capable for work

than before; unless, indeed, cheap after-dinner wit and garrulity count for such! But how is it when a man who is underfed, or overworked, or both, takes with his evening meal a reasonably moderate quantity of a reasonably dilute alcoholic beverage, such as the light wines and malt liquors? It needs no very great acumen to see that the conditions here are entirely different from those of Parkes's experiment, and that we cannot argue from the results in the one case to the other. As to the vexed question of teetotalism *vs.* temperance in the ordinary routine of civilized life, Dr. Pavy will doubtless disappoint many readers by letting it severely alone. He gives his views of the *effects* of alcohol, as indicated above, and then lets the reader take wine or water with his dinner according to the dictates of his own conscience and understanding. And herein we think he is entirely right, for to attempt to lay down the law on this many-sided question is simply to pillory one's self as a voluntary target for every extremist's ready handful of dirt.

The next section is a short one of five pages on the modes of preserving food, and then we come to an important and excellent chapter on the "Principles of Dietetics." The following is the ground covered, facts being amply cited to justify the conclusions drawn. Milk and egg, Nature's ready made food, hint by their complex composition that a combination of alimentary principles alone can afford a proper dietary for the animal. Observation verifies the hint, for an animal starves on any single food-principle, even the nitrogenous. Thus the several groups of principles beside their proper alimentary destiny, as set forth in the earlier part of the book, *react on each other*, as it were, the one, in some unknown way, directly determining the utilization of the other, as nitrogenous matter is necessary for the forming of fat out of the material of the carbohydrates. A mixed diet being then indispensable, the next question is the amount, absolute and relative, of the different kind of principles needed for proper alimentation, and practically this concerns only the organic substances. But it is plain that no universal formula can be laid down, for the dietary must vary with the varying conditions of man's state. Climate must be taken into account, for it takes more food simply to keep up the body-heat in cold weather than in hot. But other things being equal, it is to *work* that the dietary must be especially adapted. Here Dr. Pavy reviews once more the Liebig theory and its modern substitute. Of course from the point of view of the latter, the formerly-assumed importance of nitrogenous food to supply the imagined excessive tissue-waste caused by work, no longer holds place. Moreover, even viewed purely as a source of energy, nitrogenous matter holds a comparatively low rank, for a seventh of its potential energy escapes unutilized, as urea. Frankland's table of the comparative "force-producing" value of the various common articles of food is quoted, from which it appears "that .55 lb. of fatty matter will furnish the same amount of power as is obtainable from 1.3 lbs. of flour, 1.5 lbs. of sugar, 3.5 lbs. of lean beef, and 5 lbs. of potatoes." (p. 417.) Or, in cost, "the same amount of work is obtainable from oatmeal costing $3\frac{1}{2}d.$; flour, $3\frac{3}{4}d.$; bread, $4\frac{3}{4}d.$; and beef-fat, $5\frac{1}{2}d.$; as from beef costing 3s. $6\frac{1}{2}d.$, and isinglass, £1 2s. $0\frac{1}{2}d.$ " (p. 418.) But we must not let ourselves slip into the error of supposing that the supplying of energy is the sole purpose of food, and that therefore the alimentary value of different articles is in exact proportion to their mechanical equivalents. For, in the first place, although the muscles are not, as Liebig supposed, their own fuel, in action, yet there is a certain amount of wear and tear of tissue

inseparable from the doing of work, exactly as with the parts of an engine or other machine; and nitrogenous food is needed to make good this waste. Again nitrogenous principles play an all-important rôle as ingredients of secretions and in determining the utilization of the other food-elements and the proper performance of many of the vital functions; so that, since hard work means accelerated vital action generally, here is another reason why this kind of material must be plentifully supplied to the labourer. The new theory of vital dynamics is thus not at variance with the notorious fact that "hard work is best performed under a liberal supply of nitrogen-containing food." The rest of the chapter is an elaborate study of the actual amounts of the various alimentary principles required for the support of life under varying conditions, with an analysis of a great number of tables drawn from many sources.

The following section, "Practical Dietetics," deals, as its name implies, with the practical considerations concerned in the actual taking of food. Here we have throughout an exhibition of strong English common sense, the author never being led into opposing the plain teachings of ordinary experience by fanciful theoretical conclusions. We should like to give a *résumé* of the chapter, but it is itself so condensed that it is impossible to make an abstract in the space at our command. The topics treated of are the "proper food of man," "dietetic relations and effects of animal and vegetable food compared," "proper amount of food," including a consideration of the effects of deficient or redundant supply, "times of eating," and "cooking." Dr. Pavy advocates a mixed diet, as opposed to strict vegetarianism, but makes a point of showing, by theory and experience, "that the consumption of meat to the extent that many persons believe necessary for the maintenance of health and strength is not in reality so." (p. 461.) Animal food should form about one-fourth of the dietary. Three meals a day are advised, the last not later than six or seven o'clock; and whether this or the midday repast should be the more substantial must vary with the occupation of the individual, the principle being to avoid having to do hard work soon after a hearty meal. The system common to many city men of taking nothing between breakfast and a late dinner is, as it should be, severely condemned.

A few pages on the "Diet of Infants" comes next, but contains nothing calling for special comment. This section is followed by five pages on "Diet for Training." Here our author says that "the tendency of the present day is not to attach so much importance to strictness of diet as formerly, and perhaps the latitude given is sometimes beyond what is desirable." (p. 498.) We are not so sure of the truth of the latter part of the remark, as concerns training in America at least, and certainly Dr. Pavy could hardly apply it to the Oxford system which he quotes. One can hardly see how the dietetic lines could be more closely drawn than in the following scheme:—

"*A Day's Training for the Summer Races.*—Rise about 7 A. M. A short walk or run. Breakfast at 8.30, of meat (beef or mutton, underdone), bread (the crust only recommended), or dry toast, and tea (as little as possible recommended). Dinner at 2 P. M., of meat (much the same as for breakfast), bread, and no vegetables (a rule, however, not always adhered to), with one pint of beer. About 5 P. M., a row twice over the course on the river, the speed being increased with the strength of the crew. Supper at 8.30 or 9, of cold meat and bread, with perhaps a jelly or watercresses, and one pint of beer. Retire to bed about 10." (p. 501.)

This is about the diet, only *minus* the beer, to which we vividly remember subjecting our reviewing self in college rowing days; and oh! the foul loaded tongue, the boils, the savage temper, and general upsetting of a previous high state of health and vigour! But happily we are gradually learning that the severe process necessary to gain the battle to the prize-fighter, does not wholly apply in the case of the rower. The first must train off all his fat to keep his flesh from puffing up under the brutal pounding to which it is exposed, but the other is of course under no such peculiar necessity.

The last section is on "Therapeutic Dietetics." This is thoroughly practical, and again marked by good, straightforward sense. We only wish the subject were dealt with in even greater detail. After a few general remarks Dr. Pavy takes up the "particular diatheses or states of the body which different kinds of food tend to induce," as affording a key to rational therapeutic dietetics. In this connection he discusses, among other things, the influence of diet on gout, corpulence, diabetes, organic kidney disease, and urinary abnormalities. He then passes to dietetic considerations based on the state of the digestive function, both as affected by general disease, as in case of fever, and by primary disorder of the alimentary canal itself. The book ends with a collection of recipes for "Dietetic Preparations for the Invalid," followed by a very full list of English Hospital Dietaries of all kinds.

We cannot close without saying again that this is a solidly good book, well worth careful reading by every medical man. E. C.

ART. XVI.—*A Manual of Psychological Medicine, containing the Lunacy Laws, the Nosology, Ætiology, Statistics, Description, Diagnosis, Pathology, and Treatment of Insanity, with an Appendix of Cases.* By JOHN CHARLES BUCKNILL, M.D. Lond., F.R.S., F.R.C.P., Lord Chancellor's Visitor of Lunatics; and by DANIEL HACK TUKE, M.D., Member of the Royal College of Physicians of London, etc. Third Edition. Revised, Illustrated, and much Enlarged. 8vo. pp. 824. London: J. & A. Churchill, 1874.

WE bid a hearty welcome to this new edition of a work which for many years was the only one of English origin of much practical value, and which is still indispensable to all who would extend their knowledge of an important disease beyond what is required by the routine practitioner. Somehow it has happened that insanity has been made the subject of fewer monographs in our language than any other disease of equal prominence. Before Prichard's work, we had absolutely nothing of any clinical value, and his was far from supplying the deficiency. Dr. Prichard was a well-trained medical scholar, of various learning, and of a philosophical habit of mind, and these traits of his mental character were abundantly impressed on this as well as his other works. But he was deficient in clinical experience. He had none of that knowledge of the disease that can be obtained only by mingling intimately with the insane, observing their ways, their habits, their manner of thinking and feeling, and the varying phases of the disease in one and the same subject. He

sometimes generalized on a small basis of particulars, with results, of course, not always sustained by a broader survey of the field before him. Still his work will always be prized by the medical scholar, as the production of a highly philosophical observer accustomed to think for himself, unbiassed by prejudice or narrowness of view. With Bucknill and Tuke's as an exhaustive treatise, and Blandford's as a bedside companion, and Maudsley's as a guide to the higher regions of psychological speculation, the student may be considered as well provided for study and practice.

The present work is greatly enlarged by the introduction of new matter, and much improved by the rearrangement of some of the chapters. During the dozen years that have elapsed since the last edition was published, if no new principles have been established, there has, at least, been an accumulation of new facts and inquiries that could not be ignored in any faithful representation of the subject. Consequently, the book has now swelled to formidable dimensions, appalling to the physician of our day, who is reminded, every hour, that art is long and life is short. Still we think it will be found none too large for the purpose of reference.

In the chapter on Insanity in general are noticed the views recently expressed on Classification, *Ætiology*, and *Statistics*. The various methods of classification that have been proposed—*symptomatological*, *psychological*, *physiological*, *ætiological*, *pathological*—are noticed more particularly, perhaps, than their relative importance deserves. However this may be, most readers much acquainted with insanity will be inclined, we apprehend, to endorse the saying of Griesinger, that all classifications must in the end return to the principal forms of insanity—*mania*, whether acute or chronic, *melancholia*, and *dementia*—"because they are really founded on nature." Classification consists in bringing things together which have some features in common, and the merit of any particular system will be determined by the number and importance of these features, for thereby is conveyed more or less knowledge of the things associated together. To classify diseases by the bond of a single trait or incident may impart no more substantial information concerning them than we derive from the Linnæan system respecting plants. The fact, for instance, that a case of insanity has a tubercular origin, is well for us to know, because it may influence our treatment; but we cannot see what is gained by bringing all such cases into a common group. In another chapter Dr. Tuke considers "the various forms of insanity from a *somato-ætiological* point of view," the only common incident determining their association being bodily condition. Thus we have *traumatic*, *epileptic*, *senile*, *puerperal*, *pellagrous*, *rheumatic*, *climacteric* insanities, and so on. He considers it important to view the various forms of mental disorder from several points, and thus justifies his course. If any particular form, while retaining its essential psychical characters, presents another also over and above these, due to the somatic condition, and which may have been the most efficient agency in producing the attack, there can be no question, certainly, as to the importance of considering it in this relation, because, as already intimated, this may determine the treatment. While giving such a character all the weight it justly deserves, the doctor has wisely abstained from making it a basis of classification. A classification of mental diseases, that can be of any practical value, must be founded, we apprehend, on characters tolerably obvious and comprehensive; and such, in the present state of our knowledge, are chiefly psychical. Ex-

altation, depression, incoherence, raving, stupor, are phenomena discernible at sight; but the condition of the liver or lungs, the presence or absence of tubercle or syphilitic taint, congestion of the ovaries, etc., are matters to be deliberately investigated, and cannot always, with all our searching, be divested of doubt, so that, in fact, the patient may die before the physician has ascertained how to classify his disorder. The strongest plea in favour of a somatico-ætiological classification—that to know the cause is the first step towards learning the remedy—is more plausible than sound. Indeed, we are surprised that any one with much clinical experience can seriously urge it, for who has found those cases most readily yielding to treatment whose somatic conditions were most clearly understood? Then there is the other fact, utterly irreconcilable with such classifications, that half the time, at least, the exciting cause, or whatever name we choose to give to the agency most effective in producing the attack, is, to all appearance, exclusively psychical.

In discussing the causes of insanity, Dr. Tuke admits the paramount potency of hereditary transmission, as it has been generally understood. He also speaks approvingly of the doctrine, first strongly set forth by Lucas, and ably exemplified and enforced by Morel and Moreau, that the disease is often derived not merely from fully developed insanity in the progenitor, but from any abnormal condition of the cerebral organ. If we have any fault to find with this chapter, it is that the author does not give to this remarkable trait the prominence to which its importance justly entitles it. The proportion of cases attributable to overt disease in the progenitor varies, as stated by different observers, from thirty to seventy per cent. If we also claim an hereditary origin for those cases where the ancestral trouble was some other neurosis, such as epilepsy, hysteria, chorea, persistent headaches, or only some manifest mental irregularity, there will be few left in which the disease may be fairly supposed to have sprung up entirely independent of ancestral influences. In studying the ætiology of insanity, we are bound to make far greater account of the congenital organic defect than of those incidents which pass under the name of *exciting causes*, and which, being, as they are, chiefly accidental in their nature, have comparatively little scientific interest. It is well enough to know the last adverse incident which provoked an outbreak of insanity, because it may lead to some useful suggestions on the future conduct of the patient; but we shall have entered on a more fruitful field of inquiry when we study those conditions of the brain which prepare it for such attacks. There we shall learn something of the action of the ordinary physiological laws in vitiating the quality of the cerebral tissue, by which it is prepared for the operation of those abnormal activities which lead to overt disease. Study in this direction has already solved some dark problems in the production of insanity. It has demonstrated the presence of analogies not before suspected, and in place of puerile conjecture, given us an intelligent and rational philosophy. It has opened the only effectual way of preventing mental disease, however little heed may be given to it in actual practice. We learn from it something not learned before of the true relations between insanity, nervous deterioration, and crime, and look with a livelier hope for the success of future inquiries. We would not be misunderstood as making light of exciting causes as sources of disease, or a subject of investigation. We only object to the undue stress which is laid upon them, inasmuch as they are a matter of conjecture at the best, and are received and recorded

on the authority, for the most part, of the friends of patients, who catch only at casual incidents, and whose philosophy is solely of the *post hoc propter hoc* kind. With such materials, and such a way of considering them, it is not strange that the widest difference of opinion should exist respecting the effect of this, that, and the other, incident, in producing insanity, the comparative agency of physical and moral causes, and various other questions mooted in this connection. To ascertain among all the events and incidents of a man's experience, the particular thing which made him insane, requires a knowledge of his inner life that can be possessed only by an intimate friend, and not often by him, and a kind of philosophical sagacity not often witnessed in any. And yet with the knowledge of this subject as now obtained, elaborate tables are constructed with a show of great statistical accuracy, and discussions are based upon them as if they were the veritable foundation of a scientific opinion.

Dr. Tuke begins the chapter on *The Various Forms of Insanity*, by accepting the time-honoured division of the mental faculties into the intellectual, and moral or affective, and also fully recognizing the fact that mental disease may be confined exclusively to one or the other of these two orders. Accordingly he describes *erotomania*, *pyromania*, *kleptomania*, *homicidal mania*, etc., as distinct forms of disease, while remarking that cases have been sometimes referred to them improperly. All this will scarcely please those sapient observers who insist upon intellectual derangement as a constant element in all insanity, whether visible or not. It is to be regretted on account of its medico-legal relations that this scepticism should still exist, but we must console ourselves with such support as can be gathered from Pinel, Esquirol, Georget, Marc, Morel, Moreau, and others of scarcely less authority.

This part of the work is accompanied by cuts of sphygmographic tracings of the pulse, and illustrated by fac-similes of patients' writing. The former are acceptable as a record of what has been done in this way, though it may prove of little clinical use. The latter are highly instructive, and it is surprising that this source of information should have been so long neglected. More than any other it enables the observer to penetrate into the inmost recesses of the disordered mind, and discover mental movements undiscernible under the restraints of conversation. In letters to friends or others, in narratives of his performances or designs, in literary effusions in prose or verse, the person, so correct and sensible in his discourse, may betray his mental obliquity in the shape of delusion or folly, or that peculiar and indescribable succession of thought and turn of expression which is so characteristic of insanity. To the expert long familiar with the writings of the insane, the internal evidence thus furnished is not less forcible than the wildest discourse or the strangest conduct. In suspected simulation, the person's writings become an invaluable test, for while he may succeed in imitating tolerably well the aberrations of insanity in his discourse, he will inevitably fail when pursuing on paper a continuous succession of thoughts. Writers on the jurisprudence of insanity always advise the expert to examine the writings of people whose mental condition is in doubt, but, without a careful and considerable study of actual examples, the clew will hardly be obtained. Some persons, probably, by reason of mental inaptitude, would never succeed in catching the characteristic trait, and would continue to mistake the rambling of the disjointed mind for the artful device of the simulator. We are glad, therefore, that Dr. Tuke, following the

example of Tardieu, in his late work, has furnished to some extent the means of studying this manifestation of disease, though, in this limited way, its use will be chiefly to stimulate the inquirer to extend his studies in this direction. Indeed, we doubt if any contribution to the literature of insanity would be more highly prized by those who are capable of appreciating it at all, than a collection of the writings of the insane, judiciously selected, and arranged with reference to the respective forms of the disease by which they were prompted.

The chapter on *Diagnosis*, by Dr. Bucknill, the fruit of a large experience and of a nice discernment, not only exhibits very satisfactorily the present state of our knowledge, but abounds in original suggestions which, carefully pondered, will greatly aid the general practitioner. It will aid him in performing a professional duty more responsible and embarrassing than any other connected with the insane. Not that there is much danger of his mistaking insanity for some other disease, or *vice versa*, but that it becomes his business to prove its existence to the satisfaction, not only of his professional brethren, but also of courts, juries, and the newspaper press, who may make it *their* business to sit in judgment on his opinion, and punish him not only for an honest mistake, but even for a sound and just conclusion. He is obliged to reach his results, not alone, as in the case of other diseases, by means of those indefinable impressions derived from clinical observation and a true scientific insight, but rather by steps so sure, so plain, so significant, as to be appreciable to the meanest understanding. He is on that border-land between the law and the true science of insanity, abounding with snares and pitfalls, where the most honest and intelligent endeavour will not always ensure his safety. In determining upon his diagnosis, he is less anxious to be strictly correct, than he is to be able to maintain his position against the subtle assaults of those whose interest lies in proving him to be mistaken. And it has come to this, that many a physician, while clearly recognizing the insanity of his patient, and treating it as such, declines to sign a certificate, simply because the case may lack those very demonstrative indications which are associated with the popular idea of insanity. And the tendency of legislation and judicial decision is to render this duty more and more hazardous, for, under the influence of novel writers and newspapers, it would seem as if half the community had come to believe that doctors, hospital managers, and unprincipled relations, are ever ready to conspire to deprive a sane man of his liberty and property under the false pretence of insanity. In this country, the law requires in the certificate nothing more than the opinion that the person is insane and a fit subject for hospital treatment. In England, the physician must also give the grounds of his opinion; that is, the particular traits or incidents indicative of insanity, distinguishing those learned from others from such as were observed by himself; and the understanding is that the latter is entitled to far more weight than the other. Pathologically regarded, this, certainly, is not a legitimate inference. In the investigation of any case of disease, the physician is bound to use every possible source of information, and the circumstances alone must determine their relative value. In the case of children we depend mostly on the accounts of others, and in the case of adults it is not always safe to rely solely on the statements of the patient. Especially is this so in nervous diseases; and in other affections, we know by daily experience how the statements of the patient are warped by his hopes and fears. In mental diseases there are peculiar reasons for resort-

ing to the observation of others. Even when communicative, patients may labour under a derangement of perception and a confusion of thought, which render their statements quite unreliable. On the other hand, governed by a feeling of suspicion or distrust, they may utterly refuse to converse; or the stress of disease, as in acute dementia, may render them completely dumb. They may entertain gross delusions, and yet be shy of communicating them to strangers; or they may have learned that these are regarded as proofs of insanity, and therefore steadily avoid speaking of them. Sometimes a sudden, momentary fancy or caprice may prompt them to be silent. For the purpose of giving a certificate, we visited a patient lately who, after replying to one or two questions on common topics, declared he should not utter another word, and so he remained dumb. And yet he was stark naked in his room, and for several months had been unequivocally insane, his last performance, only a few minutes before, being to throw his feces in his physician's face. The humblest servant in an asylum knows that many a patient shows his infirmity in his conduct, and seldom, if at all, in his conversation, for the latter may be correct and even shrewd, while the former may abound in folly and be completely at variance with his normal conduct. Indeed one may spend weeks in the wards of a hospital, and in many of the patients still be unable to see insanity in their discourse or deportment. It is time the public were disabused of the idea that insanity may always be detected by going into the patient's room, sitting down by his side, and putting to him a string of questions. That it should be necessary to make a formal protest against such an idea, is a significant comment on the intelligence of the times. We hold, therefore, that the physician is bound, by a proper sense of professional duty, to assert and maintain his right to avail himself, in a case of insanity, of the same sources of information that he would use in any other disease.

This is but one of the many unreasonable notions and practices attributable to that confusion of medical and legal principles so characteristic of the rules of law on questions of insanity. On the supposition that experts possess knowledge in their respective pursuits not shared by others, they are allowed to enlighten the court and jury with their opinions on some matters that involve the merits of the case. It is the acknowledged ignorance of the jury that gives rise to this peculiar kind of evidence; and yet with an inconsistency that fails to excite our surprise only because it is so common, the expert is required to give the grounds of his opinion, or the processes by which he has arrived at it, in order that the jury may judge of its correctness. And thus we have the spectacle, ludicrous were not the consequences often most lamentable, of a dozen men destitute of all scientific knowledge, some of them, perhaps, unable to read or write, sitting in judgment on opinions derived, it may be, from a life-long study of insanity, or chemistry, or surgery. And so in England, the physician who gives a certificate of insanity, must state his reasons for thinking the person insane, in order that all whom it may or may not concern, may judge for themselves whether he is right or wrong. And as if this were not enough to furnish the protection needed, the law prescribes a certain form of certificate; and with a slavish subservience to the letter of the law, which in this case almost literally killeth, it insists upon a conformity to the letter as strict as if it were an indictment for a criminal offence. The physician, we may suppose, after careful inquiry, concludes that the person is clearly insane, certifies accordingly,

and flatters himself that he has accomplished a very satisfactory piece of professional work. Nevertheless, it turns out that he has laboured in vain and spent his strength for nought. The form of the certificate being covered all over with red tape, he has got entangled in its meshes. It seems that the party whose insanity is certified, rejoices in the baptismal names of Matilda Anne, and in one place he has written the latter without the final letter; or, though he has named the street in which she resides, he has neglected to give the number of the house, consequently her detention in an asylum on the strength of his certificate is illegal, and the work must be done over again. We here have been guilty of no such folly as this, but we are not sure that on the whole we have any advantage over our English brethren. Having strictly complied with the law—crossed every *t* and dotted every *i*—they are safe, but our courts are fond of making law for themselves, and the conclusions of the physician may be sacrificed to the whims and prejudices of the judge. We wish that in a work of an authoritative character like this, the supremacy of the medical opinion over all legal technicalities had been unflinchingly maintained. Unless the profession itself asserts on every proper occasion its inalienable rights, we may be quite sure they will never be recognized by others.

While we are obliged to withhold our assent to some of the views expressed in this chapter, we willingly commend it as, on the whole, an excellent exposition of the various subjects of which it treats. The account of the various forms of insanity, though somewhat supplementary to that of Dr. Tuke, will not be regarded by the reader as unnecessary, but will be welcomed and appreciated. For such help as the practitioner can derive from books in detecting insanity when concealed, exposing simulation when practised, and arriving at a correct conclusion in cases of questionable impairment, he can avail himself of no better source of instruction. On the subject of simulation we wish more stress had been laid on what, for lack of a better name, we may call the physiognomy of insanity, meaning thereby the look, the mien, the bearing, the turn of expression, the succession of thought, the blending of the real and the unreal, of the subjective and the objective, and the *abandon* which marks the utterance of extravagance and folly. Impossible as it is to render such traits cognizable to others by any art of description, who that has been long familiar with the insane has not often found in them, in the absence of other evidence, unmistakable proof of mental disease? They cannot be imitated, even by the most ingenious mimic, and indeed the attempt is never made. This internal evidence, as we may justly consider it, may not be available to the ordinary practitioner, but to the expert its value can be scarcely overestimated, and therefore we regret that it is not clearly recognized in a work of this description. The courts may not treat it with much respect, but that furnishes an additional reason why we should persist in claiming for it all the authority it deserves.

Dr. Bucknill devotes several pages to what is called the insane diathesis, or insane temperament, or insane neurosis, by which various names recent writers have designated that inherited quality of the brain which constitutes, in most cases, the first step in the evolution of that morbid condition which we call insanity. It is justly entitled to all the attention he gives it; and much more, indeed, would not have been misplaced, for we believe that no other subject connected with insanity has provoked inquiries and led to consequences of equal importance, during the last thirty

or forty years. The hereditary character of insanity, to some extent, has been always recognized, but until quite recently nobody troubled himself to inquire what became of the morbid element before its presence in the offspring was revealed by demonstrative symptoms. Whether it always remains in the system utterly innocuous, or frequently imparts a peculiar character to the mental manifestations, were questions never asked until a very recent period. Of course its presence is implied in the fact of hereditary transmission, and it is consistent with all the analogies of diseased action that it should affect the character and conduct of the individual, sometimes more, sometimes less, according to its organic conditions, and according as circumstances of life may serve to develop its activity. To ignore it entirely would be no more a mark of wisdom than it would be to ignore any other abnormal condition; and in many instances, certainly, it would be like acting the play with the part of Hamlet left out. In diagnosis, prognosis, and treatment, it must always present a consideration of the highest importance, furnishing a clew to many a mystery in the patient's conduct, and determining his special management and pursuits. Its influence on the character, its relations to unequivocal disease, its rise and progress, are matters which promise a rich reward to the careful inquirer, for they are as yet far from being well understood.

The chapter on the *Pathology of Insanity* by Dr. Bucknill, with some additions on *Histology*, by Dr. J. Batty Tuke, presents a very full and fair record of the labours of pathologists during the last ten or fifteen years, on the organic conditions of the brain. It is necessary to the completeness of a manual like this, and the task has been thoroughly and discriminately performed. The record shows that, during the period in question, cerebral pathology has been the subject of much minute and comprehensive investigation, of many new facts, and of much ingenious speculation. How much of all this is destined to take its place among the assured and permanent results, remains to be seen. We know that inquirers in the same paths have not all arrived at the same conclusions, that the revelations of the microscope have been differently interpreted by different observers, and that the speculations have often been more subtle than wise. But with all our misgivings as to the present or prospective worth of what has been done so far, it can scarcely be denied that some sure, substantial advance has been made beyond the ideas of Pinel, who was strongly disposed to doubt whether insanity was any disease of the brain at all. We know better the significance of the lesions found after death in the brains of the insane, and nobody doubts, we imagine, that the essential, indispensable change takes place prior to all these, which have only an incidental connection with it. At the very least, if we have actually found nothing, we burn, as the children say.

It would be hardly worth our while to examine the newest theories respecting the proximate cause of insanity, and discuss the current question whether it is to be found in defective condition of the nerve cell, or of the vessels by which it is nourished, because neither explanation seems to account for all the facts in the case. The favourite theory just now that insanity is caused by defective nutrition of the nerve cell, plausible as it may seem on a limited view of the matter, fails as a rule of general application. Any theory ought to explain the phenomena of sleep, and yet it is commonly supposed that, in this state, cerebral nutrition is going on with the greatest activity. The phenomena of drunkenness,

too, must be attributable to some organic movement very like that in which mania originates, but who is prepared to say that the former springs from defective nutrition of the brain? It must be admitted that the theories respecting the primary organic condition, now most in vogue, have in them a strong element of speculation, and that until they have a larger basis of well-demonstrated facts, they must be regarded with considerable distrust. Not that we would discourage such inquiries, or repress the freest speculation, because, however uncertain may be their results thus far, yet if we ever arrive at the truth, it must be by their means.

Dr. Batty Tuke is peculiarly well qualified for his contribution to the work, and he has well prepared it. His microscopic examinations have been very numerous, and they will prove a valuable aid to the student in prosecuting his studies in this direction. Some of the microscopic appearances are represented by coloured engravings. All this, of course, is new matter, for the achievements of the microscope in cerebral histology have been made within the last fifteen years or less. Unquestionably, they indicate the field on which all future discovery must be made. The scalpel has had its day, and though its work has been indispensable in the search for a correct pathology, and therefore never to be entirely abandoned, yet the solution of the problem so long and so anxiously sought, must be achieved, if ever, by the microscope. But the acknowledged difficulty of making the examination and the liability to mistake forbid us to expect this event very soon. A period of imperfection, discrepancy, and conflict must precede that of uniformity and harmony, and many a fine theory will have to go under before we arrive at unquestionable results.

To the practising physician the chapter on *Treatment* will be of more interest than any other, for the simple reason that to cure the disease or to mitigate its evils, is more desirable than to know exactly what caused it, or what the ancients thought about it. If he expects to find, as one of the results of recent inquiry, that insanity is more amenable to medication than it was when the last edition of this work was published, we fear he will be disappointed. He will find that we are still without a specific, and that the lack of uniformity of treatment is as great and embarrassing as ever. He will find that modes of treatment supposed to exert some specific action on the disease are no longer proposed, and that medication is guided by the light of an accidental experience, and of indications derived from other organs than the brain. When the various ailments that usually accompany an attack of acute mania have disappeared; when the patient has become calm, the appetite good, the secretions healthy, and sleep not very deficient; with what drug is the physician to combat the only, but the essential, ailment that remains? Nobody pretends to answer this question, though we hear much about insanity being a lesion or change of organic structure, and therefore to be treated by drugs like other diseases. Still, it must be admitted that our medication is better than it once was. If we have found no specific for insanity, we have much less of that mischievous or senseless practice which has been common enough even in our own day. If we have seen the folly of bloodletting, purgation, and submersion, we have a right to rejoice in opium, chloral, and the bromides. These last named articles, as well as many others of less importance, are very satisfactorily discussed, and we have only words of commendation for the remarks on asylums, diet, jour-

neys, and moral treatment generally, with a single exception. On the subject of mechanical restraint, American physicians having charge of the insane, differ from their English brethren, *toto cælo*. The latter, for the most part, believe that it is wholly mischievous, directly and indirectly; that it aggravates the evil it is intended to relieve; and that any good it is supposed to effect can be better obtained by the hands or eyes of attendants, or by seclusion. On the other hand, we here believe that it accomplishes the desired purpose more effectively than any other means; that the constant presence and interference of attendants, excite irritation and provoke resistance; and that they often fail to secure the intended object. We do not propose to consider this question now. It has been thoroughly discussed already, and if what has been said has failed to produce conviction on one side or the other, no repetition of it will be likely to succeed. The right, no doubt, will finally prevail. Murmurs of distrust, slight shows of resistance, now occasionally witnessed, will be followed at no distant period, probably, by free and vigorous opposition to the system of the total disuse of restraint. We will only take the opportunity to bear our testimony against the spirit of intolerance which has characterized the discussion of this question, on the part of the officers of English asylums, and remind them that it is one on which an honest difference of opinion may exist, as much entitled to respectful treatment as any other diversity of practice or precept. We would not have it supposed, that the last remark has been suggested by any manifestations of this objectionable spirit in the present work, for it is quite free from them.

Our limits oblige us to pass by several points we would like to speak of, but our purpose will have been answered if we induce the reader to make himself acquainted, by a careful perusal, with this sound, thorough, judicious work.

I. R.

ANALYTICAL AND BIBLIOGRAPHICAL NOTICES.

ART. XVII.—*Medico-Chirurgical Transactions*. Published by the Royal Medical and Chirurgical Society of London. Volume the Fifty-sixth. 8vo. pp. lxxviii., 492. London: Longmans, Green, Reader, & Dyer, 1873.

THE present volume of this admirable series contains twenty-two papers, of which we shall, according to custom, offer our readers a short account, taking up first the surgical communications, and grouping together the medical papers for after-consideration.

The first article in the volume is *On Non-purulent Catarrh of the Middle Ear*, by WILLIAM BARTLETT DALBY, F.R.C.S., M.B. Cantab., etc. This is principally founded upon notes of cases treated by Mr. Dalby at St. George's Hospital, and abstracts of twenty, which the author looks upon as typical cases, are given in an appendix. The remedies chiefly employed appear to have been repeated inflations of the tympanum, either by Politzer's method or through the Eustachian catheter, and the introduction of warm solutions of bicarbonate of soda, muriate of ammonia, or iodide of potassium, or of iodine vapour, or simply warm water, sometimes by the catheter, but more commonly by a modification of the simple method known as Gruber's. Hinton's plan of incising the membrane, and washing out the cavity of the tympanum by injecting solutions from the meatus inwards, is regarded by Mr. Dalby as only serviceable in exceptional instances. From a review of all his cases the author concludes that in cases of obstruction of the Eustachian tube, when the tympana are not involved, recovery may be expected, as it may be likewise when catarrhal affections of the tympana are treated at an early stage. When, however, the secretion has become inspissated before the patient applies for relief, and only dry sounds are heard on inflation of the tympanum, there is, in most instances, but little prospect of a satisfactory result.

The second paper is a *Case of Ovarian Dropsy operated on during an attack of Acute Peritonitis*; by RICHARD T. TRACY, M.D., etc. An abstract of Dr. Tracy's paper appeared in the Quarterly Summary of this Journal for January, 1873, page 267.

A *Fifth Series of One Hundred Cases, with Remarks on the Results of Five Hundred Cases of Ovariectomy*, is contributed by T. SPENCER WELLS, F.R.C.S., etc. From his very large personal experience in ovariectomy, Mr. Wells draws, in this paper, certain important conclusions as to the various circumstances which exercise a favourable or an unfavourable influence on the results of the operation. Comparing his *hospital* with his *private* cases, he finds that the numbers are nearly equal, and that the mortality of the former has been 26.66 as against 24.23 per cent. of the latter, thus showing a difference of only 2.43 per cent. in favour of cases treated in private practice. For limited periods of time, however, the proportion has occasionally been very different, the mortality of hospital operations having been in one series of a hundred cases more than double that met with in private patients. In seeking for the causes of this variation:—

"It has become manifest that periods of high and low mortality have corresponded with varying sanitary conditions in the hospital, or with the presence of infecting cases in some ward. After emptying the house for a month or longer, thoroughly cleansing, painting, and lime-whiting the wards, a period of almost uninterrupted success has followed. Then what some call 'a run of bad luck' set in, attributable, I believe, to crowding, to some neglect in purifying bedding, or to contagion or infection. . . . My conviction is, that the surgeon who hopes to obtain better results than have hitherto been obtained, must place his patient, whether in hospital or private practice, as nearly as he can in the position of a person in a private house—in a healthy situation, in a room where ventilation is sufficient and continual, but not excessive, and the temperature is under proper regulation; all unnecessary furniture (such as woollen carpets and curtains) removed; all bedding and clothing being perfectly clean and free from any taint of morbid poison; and the patient having the undivided attention of one trustworthy nurse for several days after operation."

The *season of the year* at which the operation is performed, and the *conjugal condition* of the patient, appear to exercise little or no influence on the result; whereas the *age* of the patient is a matter for serious consideration. Mr. Wells's statistics show that patients under 20, and those over 60 years of age, almost all recover after ovariectomy, while the highest rate of mortality (33 per cent.) is met with in those between 50 and 55. *Adhesions* to the abdominal parietes, or to the omentum, are found to be of not much importance, but adhesions within the pelvis add greatly to the risks of the operation. The *length of the incision*, as determined by the size, solidity, and weight of the tumour, exercises a marked influence on the result of the operation. When the abdominal wound has not exceeded five inches, the mortality in Mr. Wells's cases has been 21.66 per cent., as against 31.25 per cent. for wounds of six inches; 34.48 per cent. for those of seven inches; 35 per cent. for those of eight inches; 50 per cent. for those of nine inches; and 100 per cent. for incisions of still greater magnitude.

The *treatment of the pedicle* Mr. Wells expects to consider more fully upon another occasion, but he here mentions that his statistics show a mortality of 19.77 per cent. for cases in which the clamp has been employed, as compared with a death-rate of 32.65 per cent. for cases in which the extra-peritoneal method has been otherwise carried out; and of 38.63 per cent. for cases in which the intra-peritoneal method has been resorted to.

With his whole series of 500 cases of completed ovariectomy, Mr. Wells has had to report 52 cases of exploratory incision, or of uncompleted operation. In 19 of these cases death ensued in from one to fifteen days afterwards, while in the remaining 33 the patients were more or less benefited; and in 5 complete recovery was ultimately obtained. Mr. Wells terminates his paper with a calculation, after the manner of Dr. Peaslee, of the number of thousands of years which his operations have added to the aggregate life of the fairer portion of creation; an application of statistics, we must add, which has always impressed us as more ingenious than judicious.

The next paper is a *Case of Subclavian Aneurism, in which Temporary Compression of the Innominate was tried, followed by Ligature of that vessel*; by E. R. BICKERSTETH, F.R.C.S.E., etc. The patient was a dock porter, forty years of age, and the aneurism involved the third and part of the second portion of the right subclavian artery. Mr. Bickersteth employed a modification of Mr. Porter's "artery compressor"¹—itself a modification of Sir Philip Cramp-

¹ The "instrument not unlike a miniature lithotrite," which, by an odd mistake, Mr. Bickersteth describes as Mr. Porter's, is the invention of Dr. L'Estrange,

ton's "*presse-artère*"—introducing, however, India-rubber "accumulators," so as to obtain the benefits which accrue from the use of elastic pressure. This instrument was applied to the innominate artery; but on the morning of the third day the wire which compressed the vessel gave way, and pulsation immediately returned in the aneurism. The wound was thereupon opened, the compressor removed, and ligatures applied one on either side of the point of compression. Secondary hemorrhage began six days after this second operation, and recurred at intervals until the death of the patient twenty-five hours subsequently. A *post-mortem* examination showed that the innominate artery was occluded on the cardiac, but not on the distal side of the ligatures, while the sac of the aneurism was filled with laminated clot, and a clot also occupied, though it did not fill, the subclavian and axillary arteries beyond the position of the aneurism; the subclavian and innominate arteries between the aneurism and the ligature, and the carotid artery, were entirely empty. The fatal hemorrhage had proceeded from the distal side of the external ligature.

This case, studied in connection with Mr. Porter's, seems to us to show that acupressure and its modifications are ill-suited for the treatment of subclavian aneurism. In Mr. Porter's case the pressure caused sloughing of the artery, with consequent fatal hemorrhage, and in Mr. Bickersteth's case, though compression was maintained for forty-five hours, the aneurism pulsed as forcibly as ever the moment the pressure was removed. This case seems to us also to furnish a strong argument in favour of the mode of treatment suggested by Sir Wm. Fergusson, and happily put in practice by Prof. Spence, viz., amputation at the shoulder-joint as a modified distal operation: it will be observed that though, at the autopsy, the arteries between the aneurism and the ligatures were found empty, the aneurismal sac itself was filled with laminated clot, and the artery on its distal side was nearly, though not quite, occluded; now is it not obvious that if, instead of applying a ligature to the innominate, the axillary artery had been secured, the physiological demand for a blood-current through the aneurism being at the same time removed by amputation of the upper extremity, there would have been every reason to expect a successful result, without there being any risk of the secondary hemorrhage which almost inevitably follows the use of the proximal ligature in cases of this nature? If any operation at all is to be practised on the cardiac side of an aneurism involving the third and second parts of the subclavian artery, an attempt should, we think, be made to secure the obliteration of the vessel by the use of such an instrument as that devised by Dr. Speir, of New York; an instrument which, without endangering the integrity of the outer coat of the artery, severs its inner coats, and thus permits the occurrence of that retraction and contraction which are so essential in nature's method of accomplishing the desired object.

We next turn to an interesting account of a case of *Removal of a Needle from the Heart; Recovery of the Patient*; by GEORGE WILLIAM CALLENDER, F.R.S., etc. The patient, a man thirty-one years old, after a struggle in a tavern, missed a needle which he had placed in the left side of his coat, and nine days subsequently came under Mr. Callender's care, complaining of "beating" of the heart, and of constant pain extending from the left nipple towards the

and is figured as such in Mr. Porter's paper, to which Mr. B. refers (*Dub. Quart. Journ. of Med. Sci.*, Nov. 1867, p. 275). Mr. Porter's own invention is figured in Mr. Stokes's paper on Temporary Deligation of the Aorta, in the number of the same Journal for August, 1869. Crampton's instrument, which modern inventors seem to have agreed to ignore altogether, is described and figured in the *Med.-Chir. Trans.*, vol. vii. (1816), p. 365.

axilla, and down the inner side of the arm as far as the elbow. This pain and a slight fulness and sense of resistance in the fifth intercostal space were the only symptoms present, but were deemed sufficient to warrant an exploratory incision, and, as soon as the skin and superficial fascia had been divided, the extremity of the needle was distinctly felt. The foreign body moved with each impulse of the heart, describing a double curve, and was thus evidently fixed in the heart itself near its apex. Removal was effected without any difficulty, and the patient made a satisfactory recovery, though he was kept in bed for several weeks as a matter of precaution. Mr. Callender appends a table of nineteen cases (twelve of which appear in Fischer's table copied in Holmes's *System of Surgery*, 2d ed., vol. ii. p. 602), in which needles or similar foreign bodies have been removed from, or found after death in, the heart or pericardium, and shows that in none is the evidence satisfactory as to the time during which the foreign body had actually been present in the heart. He hence infers that proof is as yet wanting that life can be prolonged for more than a few weeks after the entrance of such a foreign body into the organ in question, and claims that his own case is "the only instance on record in which a patient has recovered after the removal by a surgical operation of a needle from the heart."

A Case of Excision of the Knee-joint for Disease in a Woman fifty-three years of age, with successful result, is the subject of the next communication, which is contributed by FREDERICK JAMES GANT, F.R.C.S., etc. The patient who was the subject of this operation had suffered more or less continuously for twenty-three years from rheumatoid arthritis of the left knee, the limb at the end of that time being almost useless, with fibrous ankylosis and subluxation of the joint. An attack of phlegmonous erysipelas delayed but did not ultimately prevent convalescence after the operation, and five and a half months subsequently the patient was able to walk with the aid of a stick.

The next paper gives an account of a *Successful Case of Gastrotomy in Extra-uterine Pregnancy*; by LAWSON TAIT, F.R.C.S. Ed. and Eng., etc. The patient was 29 years old, and had been married two years. She ceased to menstruate about September, 1871, and from the middle of March until July 20th, 1872, felt distinct movements of the foetus, a slight bloody discharge appearing at the latter date, and all movements ceasing from that time. When she came under Mr. Tait's care in September, 1872, the lower third of the abdomen was completely occupied by a tumour, which was more prominent on the left than on the right side, and at four points (two on each side) there were irregular movable nodules. The patient said that her size had gradually diminished during the last two months. The uterus was rather larger than in its normal condition, soft, and somewhat fixed; had an open cervix; and did not move with the tumour. By rectal exploration a hard semilunar ridge could be readily felt behind the uterus. No information could be gained by either abdominal or vaginal auscultation.

Gastrotomy, or as it should rather be called *Laparotomy*, was resorted to on Nov. 2d (nearly four months, therefore, after term), the peritoneal cavity being opened as in the operation of ovariectomy, when it was found that the roof of the sac joined the parietal peritoneum about three inches above the pubis. The sac having been opened with precautions against the escape of fluid into the cavity of the abdomen, the legs and trunk of the foetus were readily extracted; but its head, which was deeply packed into the pelvis, and adherent, was removed with great difficulty, a considerable quantity of hair indeed remaining and being subsequently picked out during the gradual closing of the sac. The umbilical cord was divided about its middle, and the placental portion allowed to hang out of the wound. The placenta, which was attached

to the posterior surfaces of the uterus and the left broad ligament, was not interfered with, and the cut edge of the sac was secured to the edges of the external wound by means of a continued suture, the upper half of the wound being then closed by deep silver sutures. The after-treatment consisted in the retention of a siphon in the pelvic cavity, and in frequently washing out the sac with a solution of sulphite of soda. Portions of placenta continued to come away until Nov. 29th, after which the wound gradually healed.

In a previous case in which Mr. Tait operated, the placenta was removed, and the patient died; the successful issue in the present instance he believes to have been due to the fact that, in accordance with Koeberle's recommendation, the placenta was allowed to remain, the peritoneal cavity closed, and the abnormal sac left open. Mr. Tait strongly advises that in similar cases an operation should be resorted to before the liquor amnii has been absorbed, and before, therefore, adhesions have been formed between the foetus and the cyst. A chart is appended to Mr. Tait's paper showing the morning and evening temperature of his patient during the time occupied by the healing of the wound.

We next come to a paper *On Disseminated Suppuration of the Kidney, secondary to certain conditions of Urinary Disturbance*; by WM. HOWSHIP DICKINSON, M.D. Cantab., F.R.C.P., etc. In this paper Dr. Dickinson describes that peculiar condition of the kidney which has recently been so much talked about as the "surgical kidney," and which he believes to be produced by the contact of unhealthy and particularly of ammoniacal urine. A short notice of Dr. Dickinson's communication appeared in the number of this Journal for July, 1873, p. 251, and as in that notice the *clinical* features of the disease in question were chiefly referred to, we shall here direct our attention mainly to its *morbid anatomy*. The pathological appearances in this form of renal disease have been described by Rayner and Brodie, and references to it are to be found in the writings of Mr. Hawkins, Dr. Wilks, and others. Both kidneys are commonly affected, the pelves being dilated, and their mucous surfaces inflamed, often encrusted with phosphatic deposits, and sometimes in a sloughing condition. The cortex of the kidney is usually thinned, its capsule being thickened and abnormally adherent both to the gland structure and to the surrounding fat.

"The glandular condition nearly resembles . . . the renal manifestation of general pyæmia. The kidney becomes swollen and full of blood, much of which remains fluid after death, though some vessels contain clot evidently of ante-mortem origin. The tissue is variegated with blotches and streaks of intense injection; it is soft, friable, discoloured, and prone to decomposition. The cones usually display to the scrutinizing eye sharply defined white lines, which start from the tips of the mamillary processes in the pelvic cavity and pass into or through the cones in the direction of their striation. These streaks look like, what indeed they are, distended tubes, and are important witnesses of perverted action. Close to them swollen bloodvessels are often conspicuous. Next, or possibly without such evidences of chronic change as the swollen tubes give, appear small, softly defined, fawn-coloured patches which streak the cortex from cones to capsule, or take the shape of wedges with the base against the capsule, the point entering the medullary tissue. These are at first scarcely less hard though more friable than the natural substance of the organ. They are surrounded and intermingled with vascularity. As the disease progresses they become large, irregular, and confluent, soften in their centres into ordinary liquid pus, and finally take the shape of scattered abscesses, varying from mere points up to the size of peas or even larger. . . .

"Passing to detail, and taking the straight tubes first as the parts of the organ first affected, these as they converge upon their outlets are often strikingly

dilated, apparently from the backward pressure of the retained urine . . . They are variously occupied by saline matter, purulent secretion, fibrin, or epithelial growth . . . The change does not extend to the convoluted tubes, which remain for the most part natural. The veins which appear to be next involved in the disease, are generally distended with blood. The straight veins of the cones often display in section a partial distension which is probably the result of coagulation which has occurred during life. The large veins of the cortex are often similarly filled, and it sometimes happens that the arteries which pass in companionship with them are likewise permanently occupied. As a general rule, however, the arteries are natural, as also are the Malpighian vessels. The venous position of the clot in the condition under consideration differs from the similar result of ordinary pyæmia, in that the obstruction there is essentially arterial. The third stage of the disease is the scattered suppuration which is the most obvious result of the complicated process. The disseminated abscesses, or regions of cellular infiltration, antecedent to abscesses, are intertubular, and have relation to the course of the veins. . . . The Malpighian bodies remain unaffected by the disease, though the adventitious corpuscular formation often collects abundantly outside them. . . .

"Taking the structural changes in their mutual relation, the dilatation of the tubular exits, the morbid occupation of the veins, and the general absence of signs of tubal inflammation, the nature of the process is clear. This disorder has its origin in the regurgitation of urine charged with morbid products. This, forced backwards by the retention general in these cases, distends or occupies the straight ducts. Thence by transudation, or similarly, it enters the neighbouring bloodvessels, and charges them with an infection resembling in its results that of pyæmia. This is distributed by the veins to the rest of the gland, sowing abscesses in their course, and ultimately causing constitutional symptoms analogous to those of pyæmia otherwise derived. The condition of the kidney may be described as one of pyæmia arising within itself."

Dr. Dickinson suggests the name *uriseptic* as applicable to this form of renal suppuration; as the disease appears to result from the retention of ammoniacal and putrid urine, he advises that an attempt should be made to restore the normal reaction of this fluid by the internal administration of mineral acids, and suggests in addition the employment of carbolic acid or other antiseptic by injection into the bladder. Two finely executed coloured plates accompany this paper and illustrate the microscopic appearances described in the text.

We shall next invite our readers' attention to an elaborate paper *On the Infective Product of Acute Inflammation*; by J. BURDON SANDERSON, M.D., F.R.S., etc. The purpose of this paper, as stated by its author, is to show, (1) that in all acute suppurative inflammations the exudation liquids exhibit poisonous or infective properties when introduced either into the circulation, the serous cavities, or the areolar tissue; (2) that these properties are manifested in two ways, viz., in the elevation of the bodily temperature and in the production of secondary inflammations; (3) that the increase in temperature results directly from the presence of the poisonous or infective agent in the blood; and (4) that the secondary inflammations may be acute or chronic, the former differing from the latter both in respect of duration and as regards their anatomical characters.

"The author arrives at no conclusion as to the nature of the substance to which the pyogenic property of exudation liquids is due. In the acute process, attended with pyrexia and the development of secondary inflammations of great intensity, there is evidence to show that we have to do with septic decomposition; not only in the fact that bacteria are present, both at the foci of inflammation and in the blood, but also in the perfect identity of the symptoms with those of septicæmia. It is not, however, as yet proved that in chronic infection the irritant is of the same nature; for, although there are all gradations between septicæmic infections of the most rapid development, and slow processes

of tuberculosis, this gradation in itself affords no evidence that the two are dependent on the same material cause."

Dr. Sanderson divides his paper into three parts, in the *first* discussing the nature of the inflammatory process, with a view to the consideration of the mode in which a primary inflammation gives rise on the one hand to fever, and on the other to secondary inflammations; in the *second* giving an account of certain preliminary inquiries conducted by himself in the year 1867-68; and in the *third* describing experiments made by Dr. E. Klein and himself in 1872, and detailing the conclusions derived therefrom. Our space does not admit of our giving a complete analysis of Dr. Sanderson's very able paper, and indeed it is hardly necessary that we should do so, for much of what is here recapitulated is already familiar to American surgeons from the author's well-known essay on the process of inflammation, in the last edition of Holmes's *System of Surgery*, and from his equally well-known communication to the London Pathological Society, an abstract of which appeared in the number of this Journal for July, 1872, pp. 253-257; we shall therefore content ourselves with giving the conclusions which result from his more recent experiments, referring our readers to the original paper for full details of the experiments themselves.

"It has been shown," says Dr. Sanderson, "(1) that that combination of malignant fever with intense and destructive inflammation to which pathologists have rightly applied the term septicæmia, because it is known by experiment as well as by clinical observation to result from the existence in the blood of putrescent albuminous matter, may also be produced by the introduction, into the circulation or into the serous cavities, of small quantities of liquids derived directly from living tissues in certain states of inflammation; and that such states have the same distinctive characters as those which distinguish inflammation of septicæmic origin. (2) That pyæmia (the term being understood to denote a general febrile disorder of less virulence than that of septicæmia, accompanied by numerous disseminated inflammations, characterized chiefly by their proneness to suppuration) is so closely related to septicæmia as regards its origin and essential nature that in these respects no line of distinction can be drawn between them; and that pyæmia, like septicæmia, may originate from a purely traumatic inflammation, independently of any infection with contagium derived from a previously existing pyæmic inflammation. (3) That both of these conditions are characterized by the existence of microzymes in the infected liquids; and that the relation of intensity between different cases of septicæmia and pyæmic infection is indicated by the number and character of these organisms; so that in the most intense processes (*i. e.* those which exhibit the characters of septicæmia), the exudation liquids and the blood are crowded with actively moving bacteria, while in the more chronic processes, the spheroidal and dumb-bell forms prevail, and the numbers of organisms found in the liquids are relatively inconsiderable."

These microzymes Dr. Sanderson believes to originate from external sources, but, he adds:—

"Even if the extrinsic origin of microzymes were proved, it would afford no ground for concluding that the origin of the contagium itself is also extrinsic. It does not at all follow because these organisms come in from outside that they bring contagium along with them; for it may be readily admitted that they may serve as carriers of infection from diseased to healthy parts, or from diseased to healthy individuals, and yet be utterly devoid of any power of themselves originating the contagium they convey."

The last of the surgical papers contained in the present volume is a *Case of Abdominal Aneurism successfully treated by Proximal Pressure of the Aorta*; by EDWARD HEADLAM GREENHOW, M.D., F.R.S., etc. The essential features of this case, which was one of much interest, have been already laid before our readers in the number of this Journal for October, 1873, pp. 548-550.

J. A., JR.

We shall next invite attention to the medical papers in the volume. *On the Morbid Effect of Alcohol, as shown in Persons who trade in Liquor*; by WM. HOWSHIP DICKINSON.—This communication is very fully noticed in the January number of this Journal for last year.

On the Respiratory Movements in Man, with an Account of a new Instrument for measuring the Movements of the Chest; by ARTHUR RANSOME, M.D., etc.—The various modes of measuring the movements of the chest in use simply give either the gross enlargement of the circumference of the chest, or the resultant of the movements of its different parts, without estimating their extent in the upward, forward, and outward directions. To supply this want Dr. Ransome has invented a very ingenious instrument the description of which we will not transfer to these pages, because it would be unintelligible without the diagrams that accompany it. In regard to the order of movement of the ribs in inspiration, the author says his experiments have convinced him that the lower ribs are the first to move, and that the movements of the second ribs are less extensive than those of the fifth, as might have been expected from the greater length of the latter bone; but they are also much less acute, and more equable in their rise and fall, showing that the work done by the upper ribs is performed more gradually and that these remain at the point of extreme expansion rather longer than the lower ribs. The amount of movement varies in different cases, being greater in children than in adults. It will also vary with the position of the person undergoing examination, but there is not so much difference between men and women in the extent of movement of the upper part of the chest, especially upon forced breathing, as had been supposed. In a large proportion of the men examined, it was found the movements on the right side of the chest exceeded those on the left; in most of the women, on the contrary, the motions of the left side were greater than those of the right side. As a rule, the movements of respiration are much less extensive in disease than in health, except where one side has undergone an enlargement to compensate for loss of breathing room on the other. In some cases the movement upwards are exaggerated. Diminished motion will be observed in patients suffering from the following diseases: emphysema, asthma, phthisis, chronic bronchitis, and acute inflammations of the lungs and pleural membrane. The paper is illustrated by numerous diagrams.

Progressive Muscular Atrophy accompanied by Muscular Rigidity and Contraction of the Joints; communicated by SIR WILLIAM GULL, Bart., M.D., F.R.S.—The principal interest in this case is connected with the examination of the nervous centres, which was made by Dr. J. Lockhart Clarke. The changes in the brain seem to have been unimportant. The white substance was found interspersed with corpora amylacea, varying from about twice the diameter of a blood disk to fourteen times that size. A few of these bodies were also scattered throughout the gray substance, but they were confined chiefly to the deeper layers. The cells of the gray substance were not altogether healthy. Some of them had lost their natural sharpness of outline. Others contained rather more pigment than usual, or were somewhat granular at their surfaces. The pons Varolii, the medulla oblongata, and spinal cord were all notably diminished in size, and were the subjects of degenerative changes. Corpora amylacea were scattered thickly throughout the substance of the first two, particularly in the white substance. Moreover, the nuclei of the following nerves: the abducens and the facial, the trigeminus, the hypoglossal, the spinal accessory, and vagus, had undergone more or less pigmentary degeneration. The bloodvessels of the medulla oblongata were much dilated. In some instances they had wholly disappeared, leaving large empty and smooth walled

tubular spaces. In the spinal cord, the gray substance from one end to the other was severely damaged by a variety of lesions and degenerations. In the upper cervical region on a level with the second and third pair of nerves, all the white columns were much congested; the connective tissue between their fibres was greatly hypertrophied. In the left lateral half of the gray substance a large triangular and somewhat transparent area of disintegration was found in the interior of the anterior cornu, leaving only a wall of healthy and darker tissue around it. This morbid area consisted only of small remnants of partially disintegrated gray substance, irregularly connected with one another, and forming together a kind of reticular or honey-comb structure. On the right side, a large area of transparent disintegration involved the whole outer half of the anterior cornu, and reached as far back as the projecting group of cells which Dr. Clarke has named the tractus intermedio-lateralis, and which is connected with the lower rootlets of the spinal accessory nerve. Extending into this track was a large hemorrhagic clot. Two other clots were formed in the neighbourhood of the first. Similar changes were discovered in the lower part of the cord, but we have not sufficient space at our command to particularize them.

The symptoms presented by the patient are very clearly explained by the morbid changes that were found in the medulla oblongata and spinal cord. The embarrassed articulation, the nasal character of the voice, the difficulty in swallowing, and the constant escape of saliva from the mouth, resemble the group of symptoms which constitutes glosso-labio-laryngeal paralysis, and are explained by the morbid changes found in the nuclei of the facial, hypoglossal, vagus and spinal accessory nerves. The great feebleness of the respiratory movements is accounted for by the lesions that were found in the anterior and lateral gray substance of the cervical and dorsal regions of the cord. The same progressive lesion of the anterior gray substances in the dorsal and lumbar regions of course explains the paralysis of the upper and lower extremities, and the decided sclerosis of the antero-lateral columns accounts for the stiffness and contraction of the joints.

A plate accompanies this paper.

The Pathology of Chronic Bright's Disease with contracted Kidney, with especial reference to the Theory of Arterio-Capillary Fibrosis; by GEORGE JOHNSON, M.D., F.R.S., etc.—Dr. Johnson's views of the nature of the changes in the form of Bright's disease characterized by contraction of the kidney are pretty generally known and were noticed in the 57th and 67th volumes of this Journal. We, therefore, propose at present to call attention only to those parts of his communication in which the opinions of Drs. Gull and Sutton, on the pathology of this disease (see April number of this Journal for 1873) are criticized. An examination of the specimens convinced Dr. Johnson, of the correctness of his first impression, that the hyaline fibroid appearance is not an indication of a pathological change occurring during life, but a *post-mortem* physical result of the imbibition of fluid by the coats of the vessels. He has never been able to detect the hyaline thickening of the external fibrous tunic in vessels examined immediately after removal from the body. It is almost always seen if the vessel, no matter what may have been the cause of death, has been immersed for some time in glycerine and camphor water, and is never seen if the preservative fluid employed be either spirit, or a solution of common salt of sp. gr. 1030. With regard to the physical conditions which favour the imbibition of fluid by the fibrous tunic of the arteries, he says, it is certain, the process is quickened by acidity of the fluid and prevented by its alkalinity. In his collection are specimens of normal arteries from the same subject, one set preserved

in an acid fluid having the fibrous tunic distended and hyaline; the others, after being distended by the acid, have been made to shrink, and again assume the fibrous character by the addition of ammonia. He thinks it not unlikely that, thickening of the fibrous tunic may sometimes occur in the vessel of the pia mater, as a result of *post-mortem* maceration in the sub-arachnoid fluid. The glycerine fluid, by distending the fibrous tunic, often presses the muscular coat more or less irregularly inwards so as to narrow the canal of the artery; frequently, too, he adds, it appears to fuse together the muscular elements, rendering them indistinct and giving the thickened wall of the artery a homogeneous or a granular appearance.

An Analysis of Ship Air and its Effects; by ALEXANDER RATTRAY, M.D., Edinburgh.—Many causes combine to render the air of ships more impure than that of houses or hammocks, and chief among them is overcrowding with deficient ventilation. While the soldier has at least 600 cubic feet of sleeping room, and from 1500 to 1800 in the tropics, the crew proper of a frigate really have no more than 63 in the densely crowded lower decks at meals, and from 105 to 222 at night on the sleeping decks. The amount of space allotted to the cadets and officers, although larger, is also insufficient for the requirements of respiration. The principal impurities which Dr. Rattray found in the air of ships were carbonic acid, sulphuretted hydrogen, ammonia, watery vapours, and organic matter. These are derived from the lungs and skin of the crew, from the ship itself, from the stores, from gun-firing, and from sea spray.

The evil results of being subjected to this unhealthy influence would be much more marked than they are, were it not that the sailor spends a great part of the day on deck, where he breathes the purest of all airs. To the bad effects of foul air of ships the author, however, attributes the low average age of seamen, and their predisposition to scrofula and phthisis. He, therefore, dwells upon the importance of securing for every vessel the best and most efficient means of ventilation. The paper is illustrated by a plate representing, 1st, fine dust from lower deck; 2d, living acari from lower deck, night air; 3d, small round and oval bodies in lower deck, night air; 4th, blood from erysipelalous leg containing animalcules.

A Second Report on the Communication of Syphilis in the Practice of Vaccination, with two additional cases; by JONATHAN HUTCHINSON, F.R.C.S.—A very full abstract of this interesting paper will be found in the number of this Journal for April, 1873.

On three Peculiar Cases of Molluscum Fibrosum in Children; by JOHN MURRAY, M.D., communicated by Thomas Smith, F.R.C.S.

Report of a Case of Molluscum Fibrosum or Fibroma, with Remarks; by GEORGE POLLOCK, F.R.C.S.

The three cases reported in the first of these papers are certainly peculiar as well as interesting, and were it not that Mr. Jonathan Hutchinson and Dr. Tilbury Fox agree with Dr. Murray in thinking that they belong to the same family group as molluscum fibrosum, we should have some difficulty in regarding them as really instances of this disease. The patients were all children, belonging to the same family, and having been subjected since their birth to the same unhealthy influences. Their parents were first cousins, but both were perfectly healthy, and had an unusually fair family history, being free from inherited or acquired syphilis. In each case the disease was first observed about the time the teeth were cut, manifesting itself primarily in the gums. In regard to the appearance of the gums, the author says, when speaking of the case in which the lesions were most marked: "They are everywhere greatly hypertrophied, and they almost completely bury the teeth. They form in parts numerous

papillomatous or polypoid-looking growths, and in other situations present a peculiar fungating appearance; indeed, this latter characteristic of their growth is at once observed. The enlargement of the gums is most marked at their upper and free surface, where they are mostly flattened out, and in parts hardened by the pressure of the opposing gum. They present the natural colour, and, although they are in parts somewhat soft, vascular, and spongy looking, they mostly feel firm and fibrous to the touch." In the same case the fingers of both hands had undergone a very striking change. "With the exception of the forefinger of the left hand," the author says "the superficial soft structures, at least of the last phalanx of the fingers and nails, are greatly and curiously hypertrophied. The enlargement, density, and appearance of the affected fingers are not at all uniform. The extremity of the finger is much more increased in size in one part than another; the surface is smooth in parts, elsewhere rough and nodular. The smooth portions present here and there a cystic appearance, as if from dilated ducts filled with clear fluid, but on pricking them, blood alone, presenting no abnormal microscopical appearance, escapes, and is not followed by local collapse. The hard and irregular portions appear to be composed to a large extent of hypertrophied epidermic structures, which here and there may be peeled off." The toes were affected in the same way as the fingers, but to a much less extent. On other parts of the patient's body the changes more closely resembled those which characterize molluscum. On the forehead there were four tumours covered by skin, and varying in size from a small pea to a date. They are described as being smooth on the surface, firm, elastic, and pretty freely movable with the skin. They were not painful and apparently not tender to firm pressure. The periosteum beneath one of these growths felt slightly thickened. Similar tumours were situated on the lower aspect of the chin and the left cheek, near the border of the lower jaw. At the junction of the right ala of the nose with the cheek was a small and slightly raised, wart-like body, a *verruca plana*. In the same situation on the left side there was a commencing growth of a similar character. Both ears presented a curious appearance from the existence of prominent growths, chiefly on the anterior aspect of the helix. They numbered altogether about a dozen, and varied in size from a millet-seed to a bean. They were painless, and mostly hard, tough, and fibrous to the touch, and covered with pale, rough and in parts glistening skin. Some of those of the posterior aspect of the arm were softer, more elastic, of a bluish colour, and apparently more vascular, and this is also true of some of the tumours on other parts of the body. On the scalp were four cicatrices, the seat of former tumours, and in the skin of the neck, and in that covering the shoulders and buttocks, numerous white glistening flat elevations were observed. These resembled in appearance smooth warts, varying in size from a pin's head to a shirt button; they were in some instances isolated and distinctly circumscribed, but in others blended together in groups of about a dozen. Notwithstanding the extent of the disease, the patient's general health was excellent. She was, however, almost deaf, and was able to articulate only a few words, and those very indistinctly. In the opinion of the aural surgeons who examined her, the impairment of hearing depended upon a nervous lesion. Inasmuch as the appearances in the two younger children, aged respectively $3\frac{3}{4}$ and 2 years, did not differ materially from those detailed above, we shall not recapitulate them, but proceed at once to give the results of the microscopical examination of one of the tumours removed from the ear. After staining thin sections with carmine, Mr. Henry Arnott found that the epithelial surface was perfectly normal, and that the loose connective tissue supporting the *rete mucosum* was also in no respect different, either in form or in

amount, from that usually met with in this position. Beneath this there was growth of firmer consistence. The bulk of this, constituting the new growth under investigation, was seen to consist of a homogeneous uniformly stained substance pervading the mass in irregularly waving broad tracks, which inclosed in their interstices smaller interlacing streaks of the same material, and numerous small cells entangled in this finer meshwork, the proportion of cells to the stroma tissue varying much in different parts of the same section. Certain portions of the tumour bore a close resemblance to cartilage, especially to the cartilage near to forming bone, where, as the result of rapid proliferation, many small cartilage cells are crowded into each enlarged space. From his examination, Mr. Arnott concludes that the tumour belongs to the connective tissue group, its histological elements being partly those of ordinary connective developing into fibrous tissue, and partly those of cartilage.

The author brings his paper to a close with a few remarks in regard to the probable cause of the disease in the three cases. "There are," he says, "two possible factors—either the bad hygienic condition under which the children were born and exposed after birth, or the parental consanguinity, or perhaps both. The eldest child of the family was a fine boy 10 years old, who was born and lived for eighteen months in a comparatively healthy first floor; the three others were born on the ground-floor of the same house; there being no kitchen or cellar beneath the sleeping apartment, which was, according to the positive statements of the parents, excessively and sensibly damp, so that the mattress on which they slept became mouldy. It is at least singular that the three younger members of the family who were all subjected *from birth* to the influence of damp for varying times, were all affected, and the disease was marked in them in a degree corresponding very much with the duration of the exposure. On the other hand, the disease progressed in all the affected children for a long time after they had been removed from the influences in question. Shortly after the paper was read, the mother was delivered of another child, who was perfectly healthy in appearance, except that there were numerous blotches (*nævi materni*) of a bluish colour, chiefly on the scalp and face."

A coloured plate showing the changes in the gums and fingers accompanies this paper.

Mr. Pollock's patient had, as far back as she could recollect, always been the subject of *molluscum fibrosum*. The growths had, however, not only increased in size since her childhood, but had also become more numerous. The photograph which is appended to this paper, shows that the tumours occupied various positions. There were three large ones, the rest, more than one hundred in number, varied in size from a small walnut to that of a split pea or even something less. One of the large ones was attached at the back of the head to the scalp and neck on the right side chiefly, and its size was about that of a small melon. A second growth was connected with the top of the right shoulder. The most remarkable and largest of the tumours was in front. This grew from the right side of the neck, and extended in the shape of a long, thick, and broad pendulous flap of skin to below the level of the navel by an inch or two. The general colour of the skin covering this mass was darker than that of the rest of the body. It was pretty uniformly marked by the orifices of obstructed sebaceous follicles, the contents of which could be pressed out to some length. In a large portion of the mass sensation was impaired. Dr. Whipham, who made a microscopic examination of one of the tumours, reports as follows:—

"The growth, therefore, is due partly to an excessive hypertrophy of the connective tissue of the true skin, and partly to an abundant cell-growth occupying interspaces between the bands of fibrous and elastic tissue, which, as has been shown, composed the chief part of the growth. Neither the large pendulous, nor the smaller sessile tumours depend upon any alteration in the epidermis, rete mucosum, glands, or hair bulbs, as far as can be made out."

The large mass was removed by an operation, and was found to weigh 2 lbs. 6 oz. The patient made a good recovery.

The Pathology of Leprosy; with a note on the Segregation of Lepers in India; by H. V. CARTER, M.D.—The destruction of the cutaneous nerves is regarded by Dr. Carter as the characteristic lesion of leprosy; the alterations of the skin, no matter what their nature may be, being secondary to this. Moreover, he believes the manifestations of the disease are limited to the cutaneous system, saying that in those cases in which the inguinal glands, the nipples, and the testes are observed to be enlarged, inquiry will show that these changes are referable to a syphilitic contamination. The lesions which are really caused by leprosy are “due to exudation or deposit in the skin and nerve-trunks of a firm, translucent, colourless or pale reddish material, which may be distinguished by the borrowed terms ‘hyalin-fibroid’ and ‘hyalin-granular.’” As regards the nerves, this deposit first appears between the individual nerve-tubules and within their common envelope, *i. e.*, the neurilemma of the funiculus; the outer sheath of connective tissue is hardly changed. By accumulation of the new material, the nerve tubes are separated, compressed, and eventually destroyed. The microscopic characters of the leprous deposit, the author continues, favour the view of its being an exudation capable of a low grade of development. At a subsequent stage, fatty or even calcareous degeneration may take place. So extensive is this affection of the cutaneous nerves, that Dr. Carter believes that it may in time involve them all.

He was in no case able to detect any constriction at the point where the nerves pass through the fascia to become cutaneous, which could account for the limitation of the disease. Sooner or later some of the deeper-seated main nerve trunks of compound function become more or less diseased, but the nerves which most frequently suffer, are the ulnar at the elbow and wrist, the popliteal in the ham, the posterior tibial at the ankle, or, in other words, at points where they are most superficial and therefore most likely to be reached by some irritative influence. It is to be noted that not every part of the larger trunks in these instances is impaired, since motor paralysis is rarely present to any extent, even in the worst cases of leprosy. The inferences which the author draws from this are that the sensory element of these compound nerves is alone implicated, and that trophic nerve tubules are commonly associated with those termed sensory.

Dr. Carter looks upon leprosy as a constitutional affection transmissible from parent to child, the tendency to which, however, in a person predisposed being increased by all causes leading to deterioration of health. He does not think that the disease has been proved to be contagious, or that it has been traced to endemic influences. Believing, therefore, that heredity is the common cause of the complaint, he argues that strict segregation of all lepers is the only way effectually to “stamp it out.”

A plate showing the microscopic character of the morbid deposit in leprosy is appended to this paper.

On the Elevated Health Resorts of the Southern Hemisphere with Special Reference to South Africa; by E. SYMES THOMPSON, M.D., F.R.C.P., etc. etc.—We shall make no attempt to analyze this paper, which consists mainly of an enumeration of places in Africa, India, Australia, New Zealand, and South America, having claims to be considered “Health Resorts,” since Dr. Thompson gives us very little information in regard to either the peculiarities of the climates of these places, or the class of patients it would be proper to send to them.

Preternatural Cavities in the Brain of the Sane and the Insane; by ROBERT BOYD, M.D., F.R.C.P.—Dr. Boyd, in the course of his investigations into the comparative frequency of tumours of the brain in the sane and the insane, was struck with the much greater frequency of an opposite condition, a partial atrophy, in the form of cavities, cysts, and depressions especially in the latter class. Thus these alterations were found in about 40 per 1000 of the sane, and in 47 per 1000 of the insane; whereas tumours of the brain were found in only 18.3 per 1000 of the sane and 16 per 1000 of the insane. A table containing 68 examples of the various forms of cysts is appended to this paper. In regard to the relative frequency of the different forms of cysts, we find that old apoplectic cysts distinguished by permanent blood staining from peroxide of iron were most numerous. Next in number to these were old serous cysts containing clear fluid and without discoloration, often accompanied by cerebral softening and most commonly met with in the insane. Next in order were small porous cavities, from the arrest and cure of ramollissement, all of them occurring in the insane. In two cases, in which there was no mental derangement, encysted abscess of the brain was discovered at the *post-mortem* examination.

Analysis of the Temperature, Pulse, and Respiration in Phthisis and Acute Tubercularization of the Lungs; by WILSON FOX, M.D., F.R.S., etc.—The observations on which this analysis is founded were made in the wards of University College Hospital upon eighty cases of phthisis, occurring, with but few exceptions, in adults who were admitted on account of the acuteness of the disease, its extent, or recent aggravation, and who were discharged, when it did not end fatally, as soon as the more urgent symptoms were alleviated. The disease was also more or less distinctly advanced, and the observations represent, therefore, the symptoms of a group of severe cases, and thus afford no information respecting the earlier stages or periods of comparative quiescence. For the sake of convenience, Dr. Fox divides his cases as follows: 1. Fatal cases. *a.* Acute tuberculosis; *b.* Acute phthisis; *c.* Chronic phthisis. 2. Non-fatal cases. *a.* With high temperature; *b.* With comparatively low temperature. The facts analyzed in the different classes relate chiefly to the following subjects: 1. The maximum temperature observed. 2. The averages of the morning and evening temperatures. 3. The frequency of normal or subnormal morning and evening temperatures. 4. The comparison of the temperature of the morning and evening. 5. The remissions and exacerbations occurring from evening to morning and from morning to evening. 6. Circumstances influencing the pyrexia. The highest ranges of temperature were observed, as a rule, in cases of acute tuberculosis, but the author found that temperatures exceeding 104° occurred in every class except in that in which are grouped cases of low temperature not ending fatally. The maximum temperature which he met with was 106.7° , but it was recorded on only one occasion in a case of acute phthisis. In all the fatal cases, with the exception of eight, the temperatures were higher than in the non-fatal, but a lower range of temperature existed in the cases of chronic phthisis than in the other fatal cases. The occasional exacerbations of fever occurring in the course of chronic phthisis are generally due to the extension, by inflammation, of the pneumonic process. In this way there is often an approximation of the temperature range to that observed in the more acute forms. In many of the cases of chronic phthisis a temperature exceeding 102° was observed. The cases included in the class of "high temperatures not ending fatally," all presented a pneumonic attack supervening on pre-existing phthisis. Their average temperatures were lower than in the other acute cases, owing to the improvement in the symptoms and the subsidence of the pyrexia

which took place as the result of treatment. The averages of both the morning and evening temperature in cases of "low temperatures" was, of course, below that of any of the other classes, rarely exceeding 100° . In the other classes there was a large number both of morning and evening averages of over 101° . Certain cases are, however, comprised in every class in which the mean of the whole series of morning temperature may be found to be within normal limits. The same fact has also been observed in regard to the evening temperatures, but with comparative rarity, except in the class of the "low temperatures." Morning temperatures, with an average within the normal, were not observed in any of Dr. Fox's cases of acute tuberculosis, but have been met with by others. Averages of the evening temperatures not exceeding 99° were met with by Dr. Fox only in cases of chronic phthisis and the class of "low temperatures." They have, however, occasionally been recorded in cases of acute tuberculosis. In one of the cases of "low temperatures" there was a complete inversion of the regular order, the morning temperature being always higher than in the evening. In this instance and in a few other instances the remission occurred between the morning and evening and not between the evening and morning. The maximum temperatures were usually attained in the evenings, and therefore the average temperature is in the majority higher for the evening than for the morning. In ten per cent. of the cases, however, the maximum temperatures observed in the morning and evening were equal, and in two of these the averages of the morning temperatures observed throughout the case were higher than those of the evening. In nineteen more, or 23.7 per cent., the maximum morning temperature was higher than the maximum evening observed, and in 15 per cent. the means of the morning temperature were higher than those of the evening. It is in the class of "low temperatures" that the higher morning temperatures are more frequently observed. Dr. Fox thinks it not unlikely that in some cases, when the morning temperature exceeds that of the succeeding evening, this may occasionally be due to a midday exacerbation; but inasmuch as very few observations were made by him at noon, he is unable to make an accurate analysis of this point. This explanation is not, however, applicable to those cases in which the morning temperature is higher than that of the preceding evening, and in which a true inversion of the order of exacerbations appears to take place. In a large proportion of cases of phthisis the temperature of the morning, when febrile, is occasionally found to equal that either of the preceding or following evening, and this equality is also observed within the normal range in cases with low degrees of pyrexia, but it is seldom maintained for more than a day. This equality of temperatures in the mornings and evenings, especially when long continued, is therefore generally associated with high pyrexia and with a severe form of the disease. Dr. Fox does not agree, however, with Niemeyer in thinking it more commonly met with in cases of acute tuberculosis than in any of the varieties of phthisis. Remissions occurred in every class. Marked remissions sometimes succeed exacerbations, but they necessarily follow one another, as a continuous or quasi-continuous temperature appears in some cases to be maintained, though generally only during short periods. The maxima recorded in these cases are a remission of 8.8° , and an exacerbation of 8.4° , which immediately succeed one another. Eight cases out of a total of seventy-five, or ten per cent., exhibited in their course remissions exceeding 5° ; and five, or 6.6 per cent., had exacerbations of corresponding extent. These eight cases were divided as follows: Acute tuberculosis, 1; acute phthisis, 3; chronic phthisis, 2; high temperatures, 1; low temperatures, 1. With these exceptions the larger remissions and exacerbations were nearly equally distributed between the fatal

cases of acute tuberculosis, acute and chronic phthisis, and the cases of high temperatures. They also occur in the class of low temperatures not ending fatally, but to a much smaller extent. From this Dr. Fox concludes, with Wunderlich, that from a thermometric point of view there is no feature which can be relied upon as a characteristic to distinguish acute tuberculosis from acute phthisis.

In regard to the cause of the variations of temperature, Dr. Fox says, this is in the majority of instances by no means distinct. He has more frequently than the reverse failed to find any positive evidence of increase of the physical signs following severe exacerbations. In many cases, however, they precede distinct and fresh pneumonic consolidations. In others they are due to rapid and extensive softening, or to intercurrent inflammation. Dr. Ringer was disposed to regard the severity of the fever as the measure of the process of tuberculization, but some cases of acute tuberculosis appear to form exceptions to this position. Pleurisy complicating phthisis may be attended by an elevation of temperature, especially when the effused fluid becomes purulent, but this is not constant; on the other hand, suffocative bronchitis and lardaceous disease of the viscera have generally a tendency to depress the temperature. Marked remissions are produced by diarrhœa, and perforation of the intestines has been observed to be followed by a fall of temperature amounting to collapse. The author has not found that hæmoptysis, even when the amount of this is considerable, exerts any influence on the reduction of temperature, and it is not followed constantly, in his experience, by the exacerbation to which attention was called by Niemeyer. Perspiration appears to be the consequence rather than the cause of the fall in temperature. As in other diseases, the patient's sensations are no guide as to the degree of fever present. The frequency of the pulse bears generally a definite relation to the intensity of the disease, but even in fatal cases it occasionally falls to less than 70° both in the morning and evening. The larger number of the quickest pulses occurs in the morning, which so far confirms Dr. E. Smith's observation, that the rate of the pulse falls after 9 P. M., and rises in the morning. The respiration is also accelerated, usually, also, in proportion to the intensity of the disease; but even in non-fatal cases a considerable number present a mean both of morning and evening respiration above thirty in the minute. No constant ratio can be established between the pulse and temperature, yet cases distinguished by rapidity of pulse are most commonly those where the temperature is highest, and conversely uniformly low pulses exist with low temperatures. Increase of temperature is observed in the evening in a larger proportion of cases than increase of pulse. The relation of the respiration to the pulse is more definite than it is to the temperature, though here also great variations may be observed. Quick breathing may be associated with a slow pulse, and, what is more common, slow breathing, with a rapid pulse. Thus, the ratio, when the breathing is very rapid, may be absolutely reversed, as pulse 72, respiration 78; pulse 76, respiration 96. A very frequent pulse may, on the other hand, increase the ratio of the pulse to the respirations by more than 6 to 1; but this may also exist to a considerable degree when, without a very rapid pulse, the respiration is proportionately retarded, and may even be observed in acute tuberculosis. The pulse respiration ratio is, on the whole, the author thinks, very little influenced by the temperature, though a ratio of the pulse to the respiration of less than 2 to 1 is most common in the "low temperatures," inasmuch as the pulse is more influenced by the temperature than the breathing. In individual cases also great variations may be noticed on different days in the relations of the pulse and respiration. The paper is a very valuable one, and

it is evident that Dr. Fox has taken great pains to make it so. An appendix contains twenty-two tables, wherein the points to which we have alluded in the foregoing notice are very fully analyzed.

J. H. H.

ART. XVIII.—*Saint Bartholomew's Hospital Reports*. Edited by Dr. ANDREW and Mr. CALLENDER. Vol. IX. 8vo. pp. xliv., 258; x., 81. London: Longmans, Green, & Co., 1873.

THIS volume, which (as we learn by a prefatory note) completes the first series of the *Saint Bartholomew's Hospital Reports*, contains, in addition to seventeen distinct articles of scientific interest, short biographical notices of four deceased officers of St. Bartholomew's Medical College, viz., the brothers William and Edward Ormerod, Frederick Carpenter Skey, and Holmes Coote. The sketches of the Ormerods are from the pen of Sir JAMES PAGET, who is perhaps likewise the writer of Skey's and Coote's memoirs, though these are published anonymously. All are well done and full of interest, candid and yet appreciative—models in our judgment of what necrological notices should be. The chief lesson to be learned from the lives of the Ormerods is the value of a strong sense of duty; as their biographer happily expresses it—

“They were very dutiful. Whatever came to be their duty, whether through choice or circumstance, they did it with all their might. Learning or teaching, practice among the poor or among the rich, work for the present or for the future—if it was duty, it was done. And they did not go far away, or take much thought, to find where or what was their duty. It was always at hand, in the common business of their calling, or if beyond this, in the nearest and best work for which they could fairly, or even modestly, think themselves fit. From their devotion to duty, more than from anything else, came their success.”

William Ormerod died when 42 years of age, Edward when 54, and Holmes Coote when 55—Skey alone living to complete his threescore years and ten.

Of the papers devoted to scientific subjects, eight may be classed as surgical and seven as medical, the remainder consisting of the Proceedings of the Abernethian Society for the college year and the Hospital Statistics. Taking up first the surgical portion, we shall now invite our reader's attention to a somewhat lengthy paper, entitled, *Two Years of Hospital Practice*; by GEORGE W. CALLENDER, F.R.S. Many of Mr. Callender's cases are of interest, and his success in treatment has been very great—greater, we venture to think, than he will be likely to find it, should he continue his statistics through a long term of years. The mode of dressing wounds employed by Mr. Callender is already known to our readers from his paper in the sixth volume of the Clinical Society's Transactions, noticed in the number of this Journal for April, 1874 (p. 458). Since the date of Mr. C.'s last published account of his practice, in the fifth volume of the *St. Bartholomew's Hospital Reports* (see No. of this Journal for Jan. 1870, p. 196), Sir James Paget and himself have performed thirty amputations, including twenty-six of the lower extremity, and Mr. Callender has treated conservatively twenty-two cases of compound fracture, including fifteen of the lower extremity, every case in both categories having terminated in recovery. As a contribution toward settling the controversy now in progress among our New York friends, as to the possibility of curing fractured thighs without shortening, we note with interest Mr. Callender's measurements in twenty cases, only four of which gave no shortening—two of these being in children aged five and seven years respectively, and one being a

case in which the fracture involved the inner condyle only, and therefore of course did not diminish the length of the limb. The average amount of shortening in the twenty cases was about three-quarters of an inch.

We must venture to dissent from Mr. Callender's doctrine that, in the treatment of urinary retention due to stricture of the urethra, "in all severe cases . . . no attempt at passing a catheter should be made until the patient has had a warm bath, a full dose of opium, and a purge." On the contrary, we believe, with Sir Henry Thompson, that in the large majority of instances, the catheter—always supposing the practitioner knows how to use that delicate and, in unskilful hands, dangerous instrument—is the proper and the only needful remedy; no doubt it is better to wait than to make a false passage, but it is better not to do either if it can be avoided, and no inconsiderable risk of the supervention of cystitis is incurred by allowing the bladder to remain distended while waiting for the effect of internal medication.

The second of the surgical papers is *A Short Account of some of the Principal Tumours removed at St. Bartholomew's Hospital during the Present Year, with some Remarks on the Growth of Fatty Tumours*; by HENRY TRENTHAM BUTLIN. Mr. Butlin, who is one of the Surgical Registrars of St. Bartholomew's Hospital, opens his paper with a plea for the employment of the word *sarcoma*—a significant circumstance when it is remembered that St. Bartholomew's has been for years the surgical home of Sir James Paget, who has been the most illustrious upholder of what may be called the English as opposed to the German system of classifying morbid growths. The word "sarcoma" is no doubt a convenient one, but it is so chiefly, we think, because it is indefinite, and this very indefiniteness is in our judgment a feature which renders the term objectionable. As used by its originator, or rather its reviver, Virchow, a sarcoma is simply a tumour composed principally of cells, and in which the cells (herein differing from those of carcinoma) are in constant relation to an intercellular substance. In this sense the word sarcoma gives no indication of clinical characteristics, and in a purely anatomical classification of tumours may be properly employed. But when we come to study the subject in the writings of other pathologists, we find confusion worse confounded. Rindfleisch classes among the sarcomata the common uterine fibroid, and declares that he "cannot separate the fibroma from the sarcomas;" Billroth rejects the fibroma, and includes the myxoma which Virchow and Rindfleisch regard as entirely independent; Arnott makes the sarcomata themselves varieties of cancer—in this Mr. Butlin follows him—excludes both fibroma and myxoma, and introduces the glioma, which Rindfleisch thinks merits a name to itself, and which Virchow likewise excludes from the sarcomata, and to which he assigns a place, as it were, midway between the other two. Finally our fellow-countryman Prof. Gross, with a happy disregard of all other authorities, erects the sarcomata into an independent group with definite clinical characteristics, midway between innocent or benign growths on the one hand, and malignant or carcinomatous tumours on the other. After repeated consideration of the whole subject, we confess that the old classification seems to us, in the present state of science, more simple, more definite, and therefore more desirable than the new. Mr. Butlin's observations on the growth of fatty tumours confirm in most respects those published in *Virchow's Archives* by Förster and Von Wittich. His paper is illustrated by means of a well-executed plate.

We come next to *A Case of Severe Suicidal Wound of the Neck*; by CHRISTOPHER S. JEAFFRESON. The patient was a woman 39 years old, and the wound, which was about five inches long, crossed the neck at the middle of the

thyroid cartilage, dividing the larynx completely, and laying the pharynx freely open. The sterno-hyoid, thyro-hyoid, and omo-hyoid muscles were quite, and the sterno-mastoid muscles almost cut through. The carotid arteries had escaped, but there had been profuse hemorrhage from the anterior jugular veins, the superior thyroid arteries, and other smaller vessels. In spite of the severity of her injury, the patient escaped the early dangers which attend such cases, but died at the end of a fortnight from exhaustion. The point of most interest in the treatment of the case was that it was found necessary to administer food through a tube introduced by the wound.

The next paper is entitled *Case of Abscess in the Brain; Pus let out by the Trephine; Complete Recovery*; by LUTHER HOLDEN. Mr. Holden's patient was a lad of 18, who received a compound fracture of the skull by the bursting of an iron bottle which he had filled with water and then placed in the fire. The fracture involved the frontal and left parietal bones, the lower fragment was slightly depressed, and there was an escape of brain matter through the wound. The general symptoms were so mild that no operation was resorted to, and in two months the boy was made an out-patient, and four months later returned to his work, the wound having ultimately healed after the exfoliation of several small portions of bone. After having been at work six months he met with a bad fall, as a consequence of which he was laid up for three weeks with repeated convulsions of an epileptiform character. These convulsions recurred after an interval of five months, and still three months later, or a year and eight months after his original accident, the patient, who had re-entered the hospital, having become almost completely comatose, it was determined to trephine the skull and attempt to evacuate the intra-cranial abscess which was believed to exist. At the time of the operation the patient was entirely insensible. The skull having been exposed, a small hole was found in the frontal bone, and a trephine being applied over this, a disk of bone was removed. As no pus was found, the dura mater was then divided and turned up, when the brain bulged into the opening, feeling tense and elastic. The operation was completed by introducing a bistoury, with the effect of evacuating about five ounces of pus, and of instantly relieving the patient from his grave condition. Convalescence was from this time gradual, but uninterrupted, and the history terminates at a period five months subsequent to the operation, when the patient was in excellent physical health, and with his memory and other intellectual faculties not in any way impaired.

There have now, we believe, been reported seven cases in which pus has been evacuated by the use of the trephine and incisions into the substance of the brain—the various examples, beside Mr. Holden's, being those recorded by Dupuytren, Detmold, Noyes, Clark, Weeds, and Maunder. Of these cases Detmold's was only partially successful, the patient, though temporarily relieved, dying seven weeks subsequently, while as to the result of Maunder's case, we have no information. The other five cases all appear to have terminated in recovery. The cases (and we cannot but believe that there have been such) in which surgeons have resorted to similar operations without benefit, do not seem to have been thought worthy of publication.

The next paper which demands our attention is *On the Treatment of Stricture of the Urethra by Retention of a Catheter*; by W. S. SAVORY, F.R.S. This is an able and well-timed plea in favour of the treatment of urethral stricture by what is known as the method of continuous dilatation. Mr. Savory prefers metallic to flexible instruments, and even carries his preference so far as to recommend that a silver catheter should be chosen when one is to be retained in position. In this respect he gives, we think, bad advice; we believe that

the development of cystitis is often due directly to the irritation produced by the retention of a metallic catheter. On another point we also venture to differ from Mr. Savory; this is as to the correctness of his statement that "for obvious reasons, it (the catheter) must be fairly in the bladder; its eyes must be clear of the prostate, and we must be prepared to make some little allowance in the way of excess in order to secure this." As is well known, the prostatic portion of the urethra is almost never involved in a stricture, and it is quite feasible to fix a catheter so that its beak rests just outside of the bladder, and so that it can be readily pushed in by the patient himself when he wishes to urinate; by this arrangement the risk of cystitis is greatly diminished, while the strictured part of the urethra is occupied by the instrument, and dilatation is as well effected as if the catheter were pushed further in. For this practical suggestion, we must add, we were many years since indebted to Prof. Joseph Pancoast, of Philadelphia.

We turn next to *Cases from the Ophthalmic Wards*; by JAMES H. STOWERS. Mr. Stowers's cases are six in number, viz.: (1) Extensive injury to the eye by strong acetic acid; (2) Lachrymal fistula; (3) Wound of the ciliary region, with partial displacement of the lens; (4) Traumatic dislocation of the lens; (5) Sclero-choroiditis anterior of both eyes; dislocation of left crystalline lens from a blow; and (6) Large vascular sarcomatous growth from the cornea.

The growth in the last case had been previously shaved off from the cornea by Mr. Vernon, but recurred after six months; upon the present occasion a radical cure was effected by extirpation of the eye.

The next paper is *On some Points in the Surgical Treatment of Intra-peritoneal Injuries*; by THOMAS SMITH. Mr. Smith begins by referring to the views of Peaslee, Wells, W. L. Atlee, Sims, and other ovariologists, as to the determining causes of the occurrence of peritonitis after ovariectomy, and particularly as to the dangers of allowing irritating fluids to remain in the peritoneal cavity; he then quotes several cases of successful ovariectomy during the course of acute general peritonitis, and narrates two cases observed by himself of fatal intra-peritoneal injury—death in one having resulted from internal hemorrhage, and in the other from peritonitis following fecal extravasation from rupture of the bowel; the latter case has already been published in the second volume of the Clinical Society's Transactions, and was noticed in the number of this Journal for April, 1870, p. 485. Referring finally to the irritating qualities often observed in the peritoneal fluid, in operations for strangulated hernia, Mr. Smith asks:—

"If it be advantageous in certain conditions, when life is in peril after ovariectomy, to reopen the wound to free the peritoneum from its poisonous contents, to cleanse it, and to keep it clean by repeated antiseptic washings, who shall say, without further experience than we possess, that the same treatment would not be beneficial, under the same conditions, after the operation for hernia. . . . When life is in danger from inflammation and suppuration within a large joint, or the pleural cavity, it is a recognized principle that surgical interference is justifiable. Does any sufficient reason exist why the same rule of practice should not be applied to the treatment of some of the diseases of the peritoneum, when life is in peril from the irritant or poisonous nature of its inflammatory products; and does not the experience of ovariologists at least warrant us in making the experiment?"

There can be no doubt, we think, that the tendency of modern surgery is to enlarge the limits within which operative interference is considered justifiable in cases of intra-peritoneal injury, and it is quite possible that at no distant day the teachings of L  gou  st and other military surgeons upon these points may be generally accepted as correct.

The next paper for our consideration gives the details of *Four Cases of Double Optic Neuritis, with Remarks*; by HENRY POWER. All of Mr. Power's cases are of interest, and the histories of three of them are completed by the results of *post-mortem* examination. In the first case there was paralysis of the fifth and other cerebral nerves, with ulceration of the corneæ ending in destruction of both eyes, and the autopsy revealed the existence of numerous tumours, apparently of syphilitic origin, scattered through the substance of the brain. In the second case there were symptoms of Bright's disease, and after death tumours were found pressing on the anterior part of the right cerebral hemisphere and in the right optic nerve. In the third case the existence of a tumour was suspected, but the patient was still living when last heard of, in September, 1873; and in the fourth case, which occurred in a child nine years old, an autopsy showed the existence of tuberculous meningitis. In this case Wecker's operation (slitting the sheath of the optic nerve) was resorted to, with apparent relief to the intense pain in the head from which the patient suffered.

The last of the surgical papers gives an account of *Three Medico-Chirurgical Cases*, and is a joint contribution by JAMES ANDREW, M.D., and GEORGE W. CALLENDER, F.R.S. The first case was one of suppuration in a misplaced kidney. The treatment consisted in tapping the kidney (which at the time of the operation formed a large fluctuating tumour in the right side of the abdomen), and then, the canula being left in place, in opening the peritoneal cavity, stitching together the opposing serous surfaces with silver wire sutures, and finally replacing the canula by a large drainage tube. The patient was greatly relieved by the operation, but, when last heard from, was still compelled to wear the tube. The authors' second case was one of leukaemia treated by transfusion of defibrinated blood, the patient having received decided though only temporary benefit from the operation. The third case was one of litho-nephrotomy, or nephrotomy for renal calculus, the stone having been removed without any particular difficulty, though the patient died at the end of the third day. In commenting upon this case Mr. Callender refers to Mr. T. Smith's well-known paper in the fifty-second volume of the *Medico-Chirurgical Transactions* (see Nos. of this Journal for July, 1869, p. 259, and April, 1870, p. 471), and to the papers of Drs. Dawson and Kearney, of Cincinnati. He also revives the famous case of the archer, from Mézerai's *History of France*, evidently being unaware that its claims to authenticity were long since effectually disposed of by Velpeau. The operations of Dr. Gunn and Mr. Durham, in neither of which was any stone found, are not mentioned.

Though this volume is announced as the last of a series, we trust that it is also a harbinger of many more to be issued in the future by the staff of St. Bartholomew's.

J. A., JR.

We shall next invite attention to the medical papers in the volume. In his paper *On Adenoid Disease*, Dr. R. SOUTHEY not only contributes to the literature of this curious and interesting affection the histories of two cases, but also gives abstracts of eighteen others more fully reported elsewhere. The patients who were under Dr. Southey's care resembled each other in having enlargements upon both sides of the neck. These enlargements were peculiar, permitting the hypertrophied condition of each separate gland to be distinctly recognized. The glands are said to have hung together like grapes on a stalk. "They were not," the author says, in speaking of one of the cases, "fused into a boggy mass like scrofulous glands; they did not feel knobby and cartilaginous like scirrhus cancer; they had individually attained larger size, and had a less

hard feel than syphilitic glands possess." In other respects the symptoms were very different. Thus one patient, a woman, was emaciated, was free from fever during the whole of her illness, and had had repeated epileptic seizures. The other, a man, was fairly nourished, had a temperature constantly above 99° , and often above 102° , and, while not the subject of convulsive seizures, presented a peculiar delirium and strange mental condition from the time he came under observation until his death. In neither case was there a marked increase in the number of the white blood cells. In the first case, in addition to the enlargement of the glands referred to above, and of some of the internal glands, the spleen was found after death to be enlarged, tough upon section, and to contain numerous whitish-yellow nodules, which varied in size from a pin's head to a split pea. In the second case the liver as well as the spleen was kidded here and there with white semi-translucent nodules. In both cases the kidneys presented the evidences of commencing Bright's disease. A careful microscopical examination of the bronchial glands taken from the body of the woman, showed the increase in size to be due to a hyperplasia of all the normal gland elements; cells with nuclei of various sizes imbedded in cytogenic reticular tissue, the structures being denser from the relative increase of the connective tissue and fibrous stroma and appearing fuller because the whole was more closely packed together.

The analysis of the 20 cases shows that the disease occurred in 16 males and in 4 females, and that the periods of life at which it was most frequently met with were those between 9 and 15 and 45 and 55 years. Its average duration was between 14 and 15 months. It ran its course, however, in one instance in $4\frac{1}{2}$ months, and in another the patient lived 3 years and 2 months. The cervical glands were affected in 12 cases, the mesenteric in 12, the mediastinal in 10, the lumbar in 9, and the inguinal and iliac in 11 cases. In one case only out of the twenty, the spleen was unusually small; in three cases it appeared to be wholly unaffected; it was extensively and peculiarly affected in sixteen cases. Emaciation, cachexia, and very marked anæmia are symptoms recorded in a very large proportion of cases. A high temperature with vomiting, and general disturbance of digestive functions were noticed as incidental occurrences in the course of the disease. Most of the patients died directly of some complication, among the most frequent of which may be mentioned ascites, pleuritic effusion, peritonitis, and diarrhœa.

It is well known that glandular enlargement is not always attended by leucocythæmia, and that there is a condition which can be distinguished from this disease only by the absence of an excess of white corpuscles in the blood. After referring to this fact Dr. Southey expresses the opinion that the leucocythæmia simply indicates a stage in the disease, a view which is adopted by Dr. H. C. Wood, Jr., in an article on the "Relations of Leucocythæmia and Pseudo-leukæmia," in the number of this Journal for October, 1871, and which is still more fully stated by M. Jaccoud¹ in a series of lectures on the *Diathèse Lymphogène*. This eloquent lecturer believes that at first the glands are enlarged in consequence simply of a hyperplasia of the true glandular elements. Later an increased development of connective tissue takes place, which subsequently contracting, renders the efferent vessels impermeable by compressing them. "So that," to use his own words, "if the white corpuscles do not find their way into the blood it is simply because the way is closed against them." Dr. Southey recommends baths, change of habits and climate, as more likely to be beneficial than medicines in the treatment of this disease.

¹ Leçons de Clinique Médicale faites à l'Hôpital Lariboisière.

Mr. NORMAN MOORE reports *A Case of Sclerema* occurring in a boy, æt. 2½, in which recovery took place after the disease had lasted ten months, in consequence, it was thought, of the long-continued administration of cod-liver oil and bark. The case is chiefly interesting from the extreme youth of the patient, there being no other instance on record in which the disease occurred at so early an age. There was no discolouration of the surface.

Dr. DYCE DUCKWORTH continues in this volume his *Clinical Observations upon Certain Skin Diseases*, giving details of cases illustrative of no fewer than fifteen classes. Inasmuch as it is impossible in the space at our command to give abstracts of the reports of all the cases, we select for analysis those which appear to us most interesting. Among the latter is a case of ichthyosis corneæ occurring in a boy, æt. 13 years, when he came under Dr. Duckworth's care. At birth, small red spots were noticed upon his body; in three days there was "heaping up" upon them. A certain degree of symmetry was noticed in the distribution of the affection upon the limbs where it ran in linear masses, raised about a quarter of an inch from the unaffected skin. At intervals on the arms were spurs of a horny nature more than a quarter of an inch in length, and slightly curved. One of these was found on the prepuce and is said to have resembled the claw of a kitten. Numerous patches of xeroderma were situated upon the surface of the trunk. The treatment consisted in the frequent employment of warm baths. A lotion composed of one part of liquor potassæ to five parts of water was applied on lint under gutta-percha muslin. Glycerine of starch was also used. Internally iodide of potassium, and quinia, together with good diet, were ordered for him. Under this treatment some improvement is said to have taken place.

In a case of xeroderma with brown ichthyosis, affecting the skin generally, benefit was thought to have resulted from inunction with olive oil. Later the surface was washed with soft soap, nitro-muriatic acid and sulphate of magnesia being administered internally. In this case Dr. Duckworth did not prescribe arsenic, and we observe that there are several cutaneous diseases in the treatment of which he does not employ it. Thus, for instance, he says he has seen no benefit arise from its use in pemphigus diutinus, nor does it appear in the list of medicines with which he treated the following affections: lichen planus, morphea, eczema papilliforme, molluscum fibrosum, and acne rosacea. On the other hand, he reports a case in which an herpetic eruption occurred in the sacro-coccygeal region in a girl who was taking arsenic at the time. Although this is the first time the author has met with this effect of the drug, he refers to a paper by Mr. Hutchinson, who has shown it to be a not uncommon occurrence. This we can to some extent confirm by our own experience, for some years ago we had under our care two patients in whom herpes zoster supervened during the administration of arsenic for another affection.

While speaking of porrigo decalvans, Dr. Duckworth refers to the local application in this complaint of liquor ammoniæ, which is recommended by Dr. Nevins, of Liverpool, who employed it with success in two cases. "The whole scalp," Dr. Nevins writes, "was rubbed with a small flannel mop soaked with strong solution of ammonia—so strong that neither the eyes nor the nose of the operator could bear it. The scalp appeared insensible to it—no pain, no inflammatory redness occurred. This was repeated daily until the scalp became sensitive, and the strength was reduced. By degrees, in a few weeks down appeared (the scalp could not bear any approach now to the strong solution), and in about six months the head was fairly covered by a sufficiently vigorous hair to allow the boys to dispense with wigs, which they had previously worn." From this, and from the results of his own experience with the remedy, Dr.

Duckworth is inclined to think that it will be found to give more satisfactory results than oil of turpentine. In a few cases the ammonia treatment cannot be borne on account of its causing vesication.

The author believes that the discrepancies which are found in the accounts of different observers in regard to the origin of the growths in molluscum fibrosum are owing principally to the examinations being made at different periods of development. He agrees with Dr. Fagge and Dr. Beale in localizing the earliest nutritional changes in the two external layers of the hair follicle; the relations between the new growth and the original follicular and glandular structures being, however, lost at a later period in consequence of the mechanical disturbance entailed by the former. The paper closes with some remarks on the topical action of chloroform upon patches of tinea, which is regarded as specific. When a few drops are poured upon the affected region and allowed to evaporate, a peculiar appearance is observed in certain of the hairs, and at their point of emergence from the scalp they become white, or of a primrose shade of yellow, and remain so. In this way the diseased hairs may be at once distinguished from the healthy. A white powdery appearance results from the action of chloroform upon the diseased patches in tinea favus of the epidermis and in tinea versicolor.

Under the name of "*Imbecility with Ataxia*," Dr. T. CLAY SHAW describes a condition resembling to some extent that to which Dr. Hammond first applied the term athetosis, and in which there is an inability to retain a fixed position owing to slow but constant action of certain extensor and flexor muscles. Dr. Hammond's cases differ from those of Dr. Shaw in some essential points. Thus they occurred in persons who, up to a certain age, had been in good health, with perfect command over all their muscles, and in none of them is there any mention made of movements in the muscles of the head, neck, or face, which in those reported by Dr. Shaw were well marked, resembling in character those of the forearm and fingers. The patients of the latter were also imbeciles, the defect in their intelligence being either congenital or having been acquired soon after birth. The term "imbecility," the author says, is difficult to define exactly, and his patients differed certainly from idiots met with in asylums. Thus, in shape and size of head and ears, arrangement and development of teeth, height of palate, power of articulation, memory, some were of first-rate order, whilst others exhibited deficiencies or defects condemning them to a lower stage of the human creation.

The movements to which Dr. Shaw calls special attention consist of a slow protrusion of the head forwards and upwards, to one side or the other, and of its retraction downwards and to one side. The facial movements are very extraordinary, and give rise to varying expressions, the most frequent being a broad grin, owing to spasms of the retractors of the angles of the mouth and the "laughing muscles," the zygomatics, and the lower fibres of the orbiculares palpebrarum, which raise the lower eyelid slightly; the forehead, too, is wrinkled. To this succeeds—or may succeed—a comparatively blank look, from relaxation of these muscles; but the marks of the wave are shown in the furrows left, giving an appearance of age greater than is actually the case. In this disease one part of a muscle may be quite at rest, the other being in motion; in chorea, on the other hand, the whole of any muscle that is affected acts at once and suddenly; the movements are regular, not disorderly, as in hysteria, or tremulous, as in paralysis agitans and the various forms of sclerosis. Dr. Shaw is inclined to think that the lesion causing this condition involves the nucleus of the seventh pair of nerves, the cervical portion of the cord, or the corpora striata. Seven

cases are reported in this paper, which contains a lithographic plate showing the varying expressions of some of the patients.

Dr. J. WICKHAM LEGG contributes an experimental paper *On the Changes in the Liver which follow Ligature of the Bile Ducts*, in which he shows that one of the most important of these is an increase of the connective tissue of that organ. This increase could be made out within a few hours after the ducts had been tied, but it was very decided in those animals which lived over the fourth day. The hepatic cells could be brushed out of the tissue, leaving alveoli of various sizes. In addition to this, great numbers of bodies, which Dr. Legg calls lymphoid corpuscles and which closely resembled leucocytes, were seen under the microscope. In regard to the cause of the hypertrophy of the connective tissue the author thinks this is to be found in the action of the ligature upon the fibrous coat of the bile ducts. An over-growth of this is set up, which extends into the porta of the liver, and thence spreads over Glisson's capsule, and the whole of the connective tissue of the liver. The chief alterations noticed in the liver cells were atrophy and fatty infiltration; the former being most marked in those animals that lived the longest, the latter in those that died soon after the operation. In some cases the atrophy had advanced to such a degree that the liver cells were not larger than leucocytes. In no case, however, were they found dissolved, which goes to prove the incorrectness of Von Deusch's theory that obstruction of the bile ducts is a cause of acute yellow atrophy; the liver cells being dissolved by the retained bile, Dr. Legg denies that bile has any such power, having never been able to produce a dissolution of the hepatic cells by the addition of bile to them. On the other hand, Winiwarter has come to the conclusion that it is the connective tissue which is first attacked in acute yellow atrophy, and Dr. Legg admits that his drawings and description of the changes in the early stage of this disease, very closely correspond to those which were found in those animals that died at about the close of a week after ligature of the bile ducts, but the two conditions are distinguishable by the course which they afterwards take; in acute atrophy the liver cells dissolve into a mass of fatty detritus carrying the connective tissue with them; in the case of ligature, the changes occur which have already been described. In cases of congenital obstruction of the bile ducts outside the liver, interstitial hepatitis has generally been found after death.

The animals used were cats, because these bore the operation better than dogs. Three out of the whole number (16) died from prolapse of the bowels. One had the diabetic puncture done on the sixth day after the operation and died on the ninth day. So in twelve only was the natural progress of events uninterfered with. Out of these twelve two died on the third day; two on the fourth; and one on the eighth, tenth, fourteenth, sixteenth, and eighteenth, and twentieth days respectively. The two others were killed on the twenty-seventh and twenty-ninth days; in them, however, the bile had found again a passage to the intestines. In one case the ligatures had eaten through the duct and were still in their place, but the bile had formed a passage outside the knot into the intestines. In the other, the common duct gave off a branch above the ligature which communicated with the duodenum. In no instance did jaundice of the conjunctiva declare itself before the tenth day after the operation, and in one not until the fourteenth; a result which differs from that obtained by Frerichs, Tiedemann, Gmelin, Leyden, and Golowin. The cause of death was obscure, but Dr. Legg is sure it was not peritonitis. He is inclined to attribute it to the changes which take place in the liver. This organ, when tested by iodine, was found to contain little or no glycogen; and when the watery extract of the liver was examined in three cases for sugar, none could be found. Further, on

the sixth day after the ligature of the bile duct, no sugar appeared in the urine after the diabetic puncture was done. Of all the functions of the liver known to us, he says, the most important is the preparation of glycogen, and this seems to pass into complete abeyance soon after the ligature of the bile ducts. Glycogen, he continues, is one of the most necessary elements of nutrition; and it is not surprising that animals should waste rapidly when the system is deprived of it.

Mr. W. MORRANT BAKER contributes a paper *On Erythema Serpens*, a disease which bears, as he himself points out, considerable resemblance to a form of erysipelas which he designates *E. ambulans*, but which is more properly called *E. erraticum*, since the redness spreads by extension from the point first attacked. The cause of the disease is without doubt the introduction through a scratch of some poison, generally decomposing animal matter, beneath the epidermis. The affection is not uncommon among butchers and women employed in preparing meat for the table. A few days, a week, or perhaps a fortnight after the reception of an injury, which in many instances is so slight that it has attracted no attention, an inflammatory flush will be found surrounding it, the redness will extend from this point in a circular manner, but as it does so, it will disappear from the part first attacked, and so it goes on spreading by a larger and larger circle. If, for example, the erythematous blotches are at first about the ball of the thumb, they will be found in a few days to have extended towards the fingers, as well as towards the wrist, and not in one direction more than another. It may therefore travel quite as readily in a direction opposed to that of the lymph and blood, as in one corresponding to it. It affects especially the region of the finger ends and knuckles, and the patient bends the fingers "gingerly," but more as if they were swollen than with the tenderness of movement belonging to an inflamed joint. There is, however, but little swelling altogether. The pain is described as very considerable, as tingling or burning and shooting, and for the most part in the hand or fingers only; but some patients describe it as also shooting up the arm. There is, however, rarely any line of redness or tenderness of the forearm; more rarely still of the upper arm, extending towards the axilla; and pain or swelling in the latter region is quite exceptional. The freedom from marked affection of the lymphatics is a distinctive feature of the disease. The constitutional disturbance is not great, but it is frequently large in proportion to the apparent local inflammation. The patient usually looks anxious or irritated, and frightened; partly from some real dread of having a bad hand, but as much from constitutional irritation. The prognosis in this form of erythema is always favourable; no case having in Dr. Shaw's experience ever ended in suppuration or in other way than by resolution and a gradual disappearance of the inflammation. The average duration of the disease is about three weeks. The treatment required is simple—fomentation with hot water, poultices, and a simple saline aperient have been almost always found sufficient. Notwithstanding the diversity which exists between the effects of this disease and those of poisoned wounds, Dr. Shaw is inclined to look upon the two conditions as essentially the same, the severity of the symptoms in the latter case being caused by the greater intensity of the original injury. In erythema serpens it is quite conceivable that the disease may begin at no lower level than the deeper layers of the cuticle. Both nerves and bloodvessels have their functions exalted, as shown by the pain and redness, but there is good reason for believing that the disease is essentially confined to the surface. On the other hand, poisoned wounds are generally caused by deeper punctures, and are accompanied by suppuration, and by inflammation of the lymphatics.

There is some analogy, Dr. Shaw thinks, between this disease and urticaria, which he conceives is caused by the circulation in the blood of some poisonous matter; the eruption being caused by some irritant, as for instance, the scratch of the finger nail, which determines the poison to a particular locality. The author, at the close of his paper, which is illustrated by a handsome coloured lithograph, refers to a variety of erythema closely resembling that described by himself which is said by Dr. Tilbury Fox to occur in persons whose hands come in contact with dyes.

In concluding our notice it gives us pleasure to say that the majority of the papers are of more than ordinary interest. J. H. H.

ART. XIX.—*Transactions of American State Medical Societies.*

1. *Transactions of the Kentucky State Medical Society*, 1874. Nineteenth Annual Session. 8vo. pp. 263.
2. *Transactions of the Minnesota State Medical Society*, 1874. 8vo. pp. 86.
3. *Transactions of the Medical Society of the District of Columbia*. Nos. I., and II., April and July, 1874. 8vo. pp. 24 each.
4. *Transactions of the South Carolina Medical Association*. Annual Session, held April 14th and 15th, 1874. 8vo. pp. 124.
5. *Transactions of the Medical Society of California during the years 1873 and 1874*. 8vo. pp. 152.
6. *Transactions of the Eighth Annual Meeting of the Medical Association of the State of Missouri*, April, 1874. 8vo. pp. 63.

THE address of the President of the *Kentucky State Medical Society*, Dr. J. W. THOMPSON, contains generally sensible remarks on a variety of matters connected with the interests of the profession in Kentucky.

Dr. ELY M'CLELLAN contributes a *résumé* of our knowledge concerning *fibroid tumours of the uterus*. The author modestly characterizes his work as an attempt to condense the results of experience and observation from all sources upon this important subject. In this he would seem to have fairly succeeded.

In a *report on surgery*, by R. F. LOGAN, M.D., we find in some remarks on the comparative safety of chloroform and ether, a sort of apology for, or explanation of the greater fatality of the former agent, on the ground that, "it is used more indiscriminately and doubtless often more carelessly than ether." We believe this assumption to be both incorrect and mischievous. The terrible and indisputable fact is, that no human care, wisdom, or foresight can prevent occasional deaths from chloroform. On the other hand, only the grossest mismanagement can render ether inhalation fatal.

The usefulness of carbolyzed dressings for wounds is believed to have been overrated. Where immovable dressings are desired for fractures, manilla paper is preferred. The writer points out as an infallible sign of fractured clavicle, unnatural prominence of the posterior border and inferior angle of the scapula. A fractured patella in a lady of seventy, united perfectly under use of the ring appliance, introduced by Dr. Gibson of St. Louis.

Reference is made to recent advances in surgical methods and procedures. Pneumatic aspiration, and the Esmarch bandage, are regarded as of the highest importance.

Dr. LEWIS ROGERS presents a brief paper on *climate in pulmonary consumption and California as a health-resort*. The views expressed are discriminating and sensible rather than sanguine.

An article on *cerebro-spinal meningitis* is chiefly interesting as containing a wood-cut, from a drawing of a parasite found in the alvine discharges of a deceased patient. What the proper name of the creature is we do not pretend to say—surely not the *tricocephalus dispar*, as styled by the writer. The drawing measures 3.5 inches by .75 inch, and is said to be taken from a microscopic image magnified ten diameters. The middle three-fifths is an oval, like the trichina capsule, but the end-fifths are, respectively, a rounded and blunt, and a slender point. We are unable to find anything resembling it in Cobbold's work. The writer names it as above indicated, and says it is seldom seen in the United States.

Under the title of *The Medical Borderland*, Dr. ANDREW MCFARLAND presents some interesting observations and suggestions upon those diseased conditions in which doubt exists as to the respective share taken by the brain, or by other organs, in the train of morbid activity.

Dr. D. W. YANDELL gives some of the facts concerning six operations for the removal of *ovarian cystic tumours*. Four patients recovered.

From a report on registration we learn that after being for over ten years without any registration system whatever, the State has lately adopted one which is very inadequate. Dr. FOSS makes a most strenuous effort to awaken his brethren from the torpor and indifference into which they have fallen concerning this matter, and to open their eyes to its pre-eminent importance. He deserves much credit for his manly appeal.

In an essay on *diseases of the conjunctivæ*, Dr. D. S. REYNOLDS makes a vigorous protest against the use of caustic applications in ophthalmia. Mild washes of any of the substances capable of coagulating albumen, he believes to be perfectly successful as well as safe, when used frequently in connection with anodynes, and with frequent removal of discharges.

Summer complaints in children, is the subject of an admirable article by Dr. J. A. LARRABEE.

Dr. FRANK WILSON directs attention to classes of cases in which *inhalation of oxygen* has been found beneficial. Among these are named obstructions of the air-passages and diminished lung capacity; also blood-poisoning by chloroform, opium, urea, etc. It is stated, too, that under such treatment indolent ulcers improve; imperfect development of eruptive diseases is made perfect; and that the assimilation of ferruginous tonics is promoted.

An article on *glaucoma* does not aim at the presentation of either new facts or new theories.

Dr. EDWARD RICHARDSON, in a paper headed *The Physician*, sets forth in a somewhat popular style some of the external conditions which interfere with the professional success of the educated and honourable physician.

Dr. J. J. SPEED asks the question, *has medicine as a science advanced?* As a rule we deprecate the publication of addresses on such general subjects. We glanced at this one with the expectation of finding a long-drawn string of platitudes and commonplaces, such as experience has but too much accustomed us to meet. Instead of this we find a bright and intelligent discussion, full of good sense and in the very best spirit. In a few clear, vigorous touches, the writer depicts the past of medicine, and traces its influence on the present. The proper field of medical treatment and the limits of the physician's interference are admirably set forth. The paper closes with an eloquent description of the intellectual and moral qualifications of the educated and zealous practitioner who rightly knows the dignity of his calling. The literary style, though not free from occasional extravagance and bad taste, is yet generally terse and

vigorous—worthy of the just and clear views and the elevated sentiments expressed.

Two papers, on *albuminuria* and *calculus in the female bladder*, do not seem to call for special notice.

The closing fifty pages of the volume are filled with a portion of an elaborate history of the *Medical Literature of Kentucky*, by Dr. L. P. YANDELL.

We are glad to be able to say that this volume is exempt from any articles which by matter or style will excite ridicule and contempt. Either the educational average of Kentucky medical men is higher, or the publishing committee more discriminating and courageous than in many other States whose medical society transactions we have been called to notice. Nevertheless, we are disposed to question the expediency of publishing essays on medical subjects, which, like some here, though open to no special criticism, are yet mere reproductions of the teachings to be found in books and journals.

The pamphlet is handsomely printed on tinted paper, but is not quite so free as it should be from typographical errors.

2. The first quarter of the *Transactions of the Minnesota State Medical Society* is occupied with the records of the last semi-annual and annual meetings. The address of the retiring President, Dr. SWENEY, deals with the obstacles encountered in the practice of medicine. The attention of the profession having been of late often called to the need of a higher standard of medical education, the speaker deemed it not inopportune to glance at another phase of the matter, and show how great and how lamentable is the ignorance of laymen. The utter recklessness and irrationality with which the public not only judge and criticize, but interfere with, the work of the physician, are forcibly illustrated. A little more attention to the rules of composition would have added to the value of this paper.

The annual essay, by Dr. H. C. HAND, treats of the *abdominal branches of the pneumogastric nerves, and their relations to the treatment of choleraic discharges*. If, perhaps, this paper contributes little of positive novelty to our physiological or even therapeutical knowledge, it has the merit of directing attention to an important subject which has not become hackneyed. Some half-dozen experiments, also, on the lower animals, are here reported. From the quoted cases of other observers, and from his own experiments, the writer believes that pressure, or cold, applied over the vagi in the neck, may prove to exercise a controlling influence over Asiatic cholera, and over other abdominal troubles. Moreover, he makes the point that in desperate cases division of the nerve on one side would be good treatment—the left when emesis is the graver symptom, and the right when catharsis threatens life.

A committee on *medical education* take high ground as to the need of a better culture. The multiplication of medical colleges is deprecated. Longer and wider courses of instruction, with examinations from time to time, and rigid enforcement of rules forbidding the reception as medical students of men destitute of general culture, are urgently recommended.

A *report on surgery* contains a case of *excision of hip-joint*, in which perfect recovery occurred, although the femur was removed down to an inch and one-fourth below the trochanter major, and a hole was broken through the acetabulum into the pelvic cavity.

The removal is reported of a testicle weighing thirteen ounces. Operations for strangulated hernia, parotid tumour, vesical calculus (weighing 609 grains), and for several cancerous growths, are briefly recorded. One terrible wound, whereby the muscles were torn off the bone, and the head of the humerus

plucked out of its socket, was treated by exsection followed by carbolic acid lotion. No sutures were used. The wound was injected and the parts kept wet with the solution—forty drops in three ounces of water and one of alcohol—and no other application made. Recovery of motion was nearly complete, and scarcely one spoonful of pus formed.

3. The *Medical Society of the District of Columbia*.—Whether warned by the example of other societies, or learning wisdom from some previous attempts at selecting matter for publication, we do not know; but we find in the first of these two modest pamphlets some principles of selection recommended by the publishing committee, which seem to us very judicious. We have so often adverted to the highly objectionable matter frequently included in the publications of medical societies, that we cannot refrain from directing attention to the rules here laid down, as admirably adapted to secure the exclusion of mere balderdash. The committee recommend that the material printed be confined to the following descriptions:—

“(a.) Original theories, or synopses of papers containing such theories. (b.) Original modes of practice. (c.) Cases testing modes of practice still *sub judice*. (d.) Cases deserving of record from their being curious or rare. (e.) New facts, experiments, or discoveries appertaining to medicine and its allied sciences. (f.) Such parts of debates as it may be deemed by this committee would, if published, be of general interest to the profession at large, or tend to promote the advancement of medical science.” Had these rules been in force elsewhere we should have been spared the necessity of saying some very unpleasant truths.

A case is reported of ulceration of the *appendix vermiformis*, resulting in perforation, sacculated abscess, external opening, and the discharge of two silver-coated quinia pills taken some days previous. *Congenital malformation of the diaphragm*, resulting in sudden death at the age of fifteen years, while lying in bed, is reported by Dr. THOS. MILLER. The stomach, spleen, and a portion of intestine had passed up through an opening two or three inches in diameter, and had hampered the heart's action.

Attention is directed to the agency of powerful cathartic vermifuges in producing intussusception.

In a case of congenital *atresia of the œsophagus* life was prolonged till the eleventh day. The child nursed well, but the milk was regurgitated “after a short time.” The *œsophagus* formed a *cul de sac*, with no communication with the stomach. “There was a communication, however, between the stomach and bronchial tubes.”

Three instances of congenital stricture of the intestine occurring in one patient are reported.

Poisoning through an abraded finger, in the delivery of a dead child, led to quite severe though transitory symptoms.

Two cases of successful *ligation of the right common carotid artery* are reported.

Extra-uterine pregnancy, in a woman of twenty-five, terminated in death by internal hemorrhage at the third month. The uterus was enlarged, and contained a well-formed decidua. Together with about a gallon of clotted blood was found, in the abdominal cavity, a fœtus of ten weeks which had escaped by rupture from the right Fallopian tube. There were small cystic tumours in the right ovary and upon the exterior of the uterus.

Death from *rupture of uterus*, with contracted pelvis, is reported.

Twin pregnancy with twin placenta, and several unimportant cases, are briefly presented.

In a discussion upon the use of ether or chloroform, the weight of opinion was decidedly adverse to the latter. One physician, however, has so little fear of it that he allows his own children, afflicted with pertussis, to inhale it from the bottle.

A successful case of *tracheotomy* for membranous croup was narrated, and two specimens of false membrane exhibited. One of these was a perfect mould of the parts from the larynx to the bronchi; and the exudation was once reproduced. Attention was directed to the efficacy of *copaiba* in croup, used generally and locally.

A case of *hæmaturia* and several cases of *erysipelas* were discussed.

The second number of this series opens with another case of *multiple intussusception*, in a case where anthelmintics had been given.

An interesting case of cancerous tumour separating and compressing the œsophagus and trachea is reported. Some symptoms indicated pressure upon nerves.

An interesting debate on climate as affecting phthisis, brings out individual testimony of experience in different regions.

Fatal cases of *Bright's disease* and of *perineal section* for stricture gave rise to discussions on the nature of the former, and on the cause of death in the latter.

An address upon *syphilis*, by Dr. J. F. THOMPSON, gave rise to discussion as to the duality of the malady, and as to treatment.

A debate upon *ovariotomy*, and a synopsis of an address on *hyponutrition of bone*, with the discussion ensuing, are interesting and instructive. The address calls attention to the frequency with which, both before and after birth, certain bones are inadequately developed. This lack of growth, too, is not unfrequently mistaken for active disease or its results.

Dr. JOHNSON ELLOT has tried, and highly recommends, hypodermic injections of whisky, where immediate and powerful stimulation is demanded without delay.

4. The *Transactions of the South Carolina Medical Association* seem to us to be unusually good. The articles and observations are almost without exception interesting and instructive.

In the report of the meeting, we find an account of an amputation of the foot, in which the malleoli and a portion of the os calcis were left to add firmness and bulk to the stump. Dr. TURNIPSEED, who performed the operation, believed a better stump and a somewhat longer limb resulted from the retention of the os calcis. Dr. KINLOCH was disposed to doubt whether this method would give as good results, generally, as that of Syme.

The annual address of the President, Dr. S. BARUCH, is entitled "*Methods of Fostering the Interests of Medicine and its Votaries.*" One of the points made is the wisdom and expediency of keeping the mind open to lessons from all sources.

Medical societies, the recording and discussing of cases, and the reading of medical journals, are recommended as essential to professional improvement. We question whether the multiplication of medical schools is desirable—as the speaker might be understood to signify. On the contrary, we believe, better results would flow from a few great schools, with a high standard, located in our larger cities, than from the increase or maintenance of smaller ones scattered all over the country.

A committee appointed the year before, to inquire into existing knowledge as to the *growth and reproduction of bone*, presents a well-written summary of the views of the chief authorities.

Another committee deals with the *effects produced upon the fœtus by the administration of chloroform* to parturient women. The statements of many writers are brought together, and their value discriminatingly weighed. The committee believes that there is no evidence that any moderate use of the drug injures the child. Experiment upon the lower animals is suggested as a means of ascertaining the degree or protraction of narcotism necessary to affect the offspring. The report excited considerable discussion.

Dr. BUIST presented an account of the removal of a *tumour of the upper jaw*, from a negro boy of nine years. It was of only ten months' growth when operated upon, and nearly filled up the mouth, besides causing great external swelling. The whole left upper maxillary bone was removed. The formation presented the characteristics of *epulis*. Recovery was rapid and complete. Three years later the patient was perfectly well and exhibited very slight traces of the operation.

Prof. F. L. PARKER puts upon record four cases. The first is that of a woman ill with *Bright's disease*, in whom the ophthalmoscope revealed that degenerative form of retinitis peculiar to such cases. The case is made the text for some general remarks on the etiology of the kidney disease, and an account of the different forms of visceral impairment which may attend it.

The second case is one of most extraordinary *comminution of the frontal and other bones* of the head and face. The patient was comatose when found, rallied partially, but died five days later. Only one small, penetrating wound was found in the scalp, the violence having been done with some flat or rounded body. The autopsy revealed the following fractures—frontal bone in twelve pieces; left temporal and parietal, three; right temporal; parietal; sphenoid; ethmoid; both supra-orbital arches; orbital plates of frontal, sphenoidal, ethmoidal, and superior maxillary bones; and both malar bones. The latter were disarticulated from the maxillary on both sides. One fracture was through the sella turcica, with wide separation. The membranes, and two great sinuses, were torn. The ventricles and brain substance were full of extravasation, and much broken down. That any attempt at reaction should follow such terrible injury is surely wonderful.

Urethral stricture, leading to hypertrophy, and amputation of the penis, is the subject of the third case. The organ weighed a pound, and was generally enlarged. Stricture was almost continuous, and fistulæ very numerous. Great improvement to general health followed the operation.

The fourth case was one of fatal *intussusception* in a young infant. Part of the ileum, the cæcum, ascending colon, and three-fourths of the transverse colon were passed down into the lower bowel, even protruding from the anus. This case having led the writer to investigate the literature of the subject, he makes a condensed statement of medical knowledge and opinion on intestinal obstructions, and especially upon their treatment by abdominal section. The doctor very handsomely acknowledges that, after giving much labour to the investigation, he came across the monographs of Drs. Stephen Rogers and Samuel Whitall, and finding their means of collecting facts were ampler than his own, availed himself freely of their results.

Dr. E. B. TURNIPSEED gives an account of the *removal of a knife-blade* from the head of a negro man, after remaining for three years imbedded in the anterior left lobe of the brain. He had been stabbed in a quarrel, but had no certain proof that the blade was left in the wound. Epileptic convulsions soon

appeared, and continued with great though variable frequency. His condition was so very bad that Dr. T. resolved to expose the slight bony swelling which marked the wound, and, if nothing was found, then to trephine. The blade was discovered very readily and removed. No further interference was judged to be advisable. The piece of steel was one and a quarter inches long, one inch having been in contact with the brain. Convulsions have since occurred, but with diminished frequency.

Dr. BUIST, having met with two cases of the parasite known as the *guinea worm* or *dracunculus*, gives a very interesting account of the conduct and the effects of this most formidable and curious creature.

Dr. GIBBES describes a case of *hernia* in a man of fifty-seven years, of the same character as congenital hernia, or "into the funicular portion of the vaginal process of the peritoneum." The swelling had first appeared, suddenly, after great exertion, thirty-three years before. In the first operation the sac was not opened; but as there appeared a strong tendency to renewed trouble Dr. Gibbes decided to remove the whole large and thick sac, with the cord and testicle. The neck of the sac was then fixed by stitches, in the canal, and the result has been a radical cure.

Twin pregnancy, with abortion of one ovum at the second month, and full development of the other, is reported by Dr. W. T. C. BATES.

Traumatic epilepsy, appearing ten years after fracture of the skull, and treated three years later by removal of diseased bone, is the subject of an extremely interesting paper by Dr. JOHN T. DARBY. Convulsions had become so alarming, frequent, and severe that the patient wished to take even the smallest chances of relief. Pressure on a certain portion of bone always causing distress, that portion was removed with a Hey's saw. The patient recovered well, and has been vastly better, though not wholly free from epilepsy; two convulsions occurring in eleven months.

The patient was shown to the Society, and much discussion ensued as to the probability of his improvement continuing.

Dr. GIBBES reported an operation for *hare-lip* in the case of an adult negro. He believes this and other arrests of development to be very rare in the African race.

A case of *albuminuria*, apparently due to Bright's disease, was treated with nitric acid, by Dr. TURNISEED. The albumen ceased to appear after six weeks, but the treatment was continued for several months. Some eighteen months have now passed without any recurrence of symptoms.

5. This handsome and neatly-printed number of the *Transactions of the Medical Society of California* opens with a report from the publishing committee. Careful preparation for the press, and constant attention to condensation, are the sensible points suggested to writers; we nevertheless find the committee closing with the curious request to "critics, and especially *hypercritics*" to "spare their shafts, if any target presents itself throughout the volume, which might be open to the armature of these *toxophilites*." What is that criticism worth which fails to point out the wrong, the false, or the foolish in a work, as well as the good, true, and wise? To praise everything may be a pleasant and comfortable course, but not one leading to edification.

After the usual record of the meetings of the Society we have the annual address by the President, Dr. PINKERTON. That his subject was the necessity of a higher professional education is one of many signs of the times, indicating how widespread is the perception of an improvement needed, and how general the desire to aid in its attainment. The views of the orator are sensible and well expressed.

In the form of a *report on ophthalmology and otology*, Dr. WM. F. SMITH exhibits an analytical table of his practice as a specialist during the year. Some suggestions are offered as likely to prove useful to the general practitioner; and some remarks upon methods of operating for cataract. A new incision has very recently been tried by him, with apparent success. It is corneal, transfixing the transverse diameter, and so completed as to bring the centre a millimetre above the centre of the undilated pupil. Dr. Smith has learned, from a gentleman who accompanied Captain Hall's polar expedition, that among the natives of some region visited there is performed a rude operation for the relief of cataract. It is done by old women, under the guise of charms or mysterious influences; but it was found that a needle-formed fish-bone was thrust into the centre of the eye; and that cure often resulted.

Dr. F. W. TODD, in a *report on obstetrics*, glances at the advances of this branch of medicine; and gives brief accounts of two or three cases recently observed by him.

Dr. C. CUSHING gives his views on the *management of abortion*. When hemorrhage becomes considerable, if the os is not enough dilated to permit the removal of the ovum, he inserts sponge-tents. These control bleeding much better than vaginal tampons, and at the same time prepare the way for removal of the cause. Inserting a tent, or replacing one by a larger, the physician can, he thinks, leave his patient for hours with perfect safety. Monsel's solution applied by a sponge to the uterine surface is used when bleeding continues after dilatation and removal of ovum. Opiates are usually employed as recommended by other writers. Dr. Cushing has never witnessed ill results from the persulphate; nor has it produced severe pain.

A *report on public hygiene and State medicine* is presented by THOMAS M. LOGAN, M.D., Secretary of the State Board of Health. The paper is an earnest and thoughtful exposition of the immense value of health boards, of the functions which they should perform, and of the discouragements and impediments encountered by the California Board. So little appreciation of sanitary science had the legislature that a serious attempt was made to abolish the Board. We infer from Dr. Logan's remarks that the defeat of this attack was due more to popular intelligence and good sense than to legislative wisdom or professional interest. For he goes on to deplore the want of support and co-operation on the part of physicians. The registration system has practically failed for lack of proper professional action. Not only have physicians neglected their duty, but in many cases have actively opposed and refused to comply with the law. This sad state of things is attributed to the tolerated existence of so large a body of ill-educated and unfit men in the medical profession. No adequate measures are taken, or even attempted, to separate the chaff from the wheat. No high standard is set up, and no lines drawn to properly distinguish the educated and honourable physician from the unprincipled and often ignorant adventurer. If the showing here given is a fair one, the profession of California cannot too soon make a vigorous effort to purge their ranks and draw tight the reins of discipline. The best and ablest must enter into the fight, instead of standing aloof, as, according to Dr. Logan, some of them do.

A good paper on *infant hygiene*, prepared by Dr. VAN WYCK, has for its principal point an attempt to show that cream—from cow's milk—diluted and sweetened with sugar-of-milk, forms the best imitation of "mother's milk." This mixture avoids that excess of caseine, compared to butter, which exists in cow's milk, and is the cause of its indigestibility.

Dr. ANDREI presents a somewhat full abstract of the pathological changes leading to *ankylosis of the knee-joint*, and the treatment adapted to prevent

and to relieve it. The old practice of allowing the inflamed joint to repose in a semi-flexed, lateral posture, is condemned. The dorsal position, with extension, and slight changes, day by day, from angular to straight and back again, are believed to be good treatment to prevent ankylosis. Various methods of breaking up adhesions are carefully compared.

Dr. LEVI C. LANE removed a *left parotid tumour*, which was the seat of severe neuralgic pain. Converging strabismus, and deafness, had also begun upon the same side. Two months later, the wound being wholly healed, and strabismus and deafness unchanged, the terrible hemicrania which had nearly ceased returned with increased violence. Treatment failing, it was accidentally found that pressure on the left carotid stopped the pain. The artery was therefore ligatured below the omo-hyoid muscle. All went well, and the neuralgia was cured. The time since is unfortunately not stated.

The doctor also reports a new operation for *ectropion*.

Dr. BARKAN gives some interesting results of his experience with *foreign bodies in the eye*.

Dr. DUTTON describes some very ingenious *appliances*, original and otherwise, for treating fractures, in places remote from elaborate apparatus. Attention is drawn to the fact that accurate comparative measurements of sound and broken limbs can be had only when the two are subjected to equal stretching force, to relax muscles and lengthen ligaments. Extension by weights, for some hours, will appreciably lengthen the sound leg. The writer's devices for hoisting the loaded fracture bed, for affixing pulleys, for insuring accurate measurement, etc., are shown by wood-cuts.

The method of counter-extension, used in St. Mary's Hospital, San Francisco, in fractures of the femur, is explained by Dr. MILLINGTON. The long, straight splint, with adhesive plasters from knee down to lower end, and from the thigh muscles up to upper end of splint, are the means used.

In a paper by Dr. GIBBONS, entitled *Contributions to the Medical Botany of California*, we notice some eight cases seeming to show the very great power over asthma exercised by the leaves of the *Grindelia*. It would seem even to effect a radical cure in uncomplicated cases. In pertussis its influence was less marked, but very good.

We would like to give some idea of the tenor of each paper in this pamphlet; but space will allow us only to name the titles of the few that remain.

Polypi of the uterus, by Dr. AYER. Case of *amputation of both legs*, using a modification of Esmarch's bandage, by J. C. VAN WYCK, M.D. *Treatment of urethral stricture by internal section*, by Dr. C. BRIGHAM. *Foreign bodies in the alimentary canal*, by AUG. TRAFTON, M.D. Report on *medical microscopy*, by Dr. J. H. WYTHE.

The present number of these Transactions is wholly free from the objectionable matter which occasionally finds admission into similar works, through the too easy good-nature of the societies or their publishing committees. The papers are useful and interesting, and their composition shows little of that slovenliness which is sometimes so painfully apparent. We heartily congratulate the Society on the excellent work prepared by their committee.

6. The publishing committee of the *Transactions of the Medical Association of the State of Missouri* announce that two papers are omitted from this collection on account of their authors' having already sent them to medical journals, and three at the request of the writers. We cannot but regret that the kind of modesty here shown is not oftener met with.

Here, as elsewhere, we find proofs of the widespread dissatisfaction among

physicians with their status before the community. A committee makes a report upon medical education, in which facts are recognized, and means of improvement suggested. A desire is also expressed for fuller teaching of medical jurisprudence in the medical schools.

An act having passed the legislature requiring, after September 1, 1874, the registration of physicians and surgeons, a resolution was offered looking to the exclusion of quacks, through the co-operation of the county and State societies with the authorities, by preparing lists of irregulars, and by scrutinizing diplomas; but the proposal failed.

The papers presented include reports on the progress, respectively, of medicine and of surgery, in which are noted some of the chief discoveries and improvements recently made.

Dr. RUMBOLD gives drawings of various forms of atomizers, by aid of which he treats diseases of the nasal and pharyngeal cavities. He claims that the ordinary nasal douche does not reach all parts; and that no single spray-producer can do so. Using different forms for different localities, the end is completely attained.

A paper on *electricity in medicine*, and an abstract of one called *Ophthalmic Portents*, make up the remainder of this modest little book. The papers are unpretending, but written with care. The one upon surgical progress is quite full and interesting.

B. L. R.

ART. XX.—*The Toner Lectures. Lecture III. On Strain and Over-Action of the Heart.* By J. M. DA COSTA, M.D., Professor of the Practice of Medicine in Jefferson Medical College, etc. Delivered May 14, 1874. 8vo. pp. 28. Washington: Smithsonian Institution, 1874.

THIS is the title of a lecture, being the third of the "Toner lectures," delivered in Washington, May 14, 1874, and published in the *Smithsonian Miscellaneous Collections*, August, 1874.

Professor Da Costa has already, in the *American Journal of Medical Sciences* for January, 1871, and in the *Medical Memoirs of the U. S. Sanitary Commission*, issued in 1867, called attention to a morbid condition which he appropriately terms "irritable heart," and to enlargement as produced by over-strain of the organ, especially in soldiers during long marches. The object of this lecture is to present further facts, derived from private practice, in reference to these topics. Premising the consideration of these topics with a notice of some cases of rupture of the valves induced by the strain incident to violent muscular exertions, and to nervous shock, Prof. Da Costa cites facts showing that among the causes of an irritable heart, in other words, of more or less persistent functional disorder of this organ, is the over-action arising from severe muscular exercise and mental excitement. There can be no doubt that these causes are to be reckoned with others which are more fully recognized, namely, dyspeptic disturbances, sexual abuses, and the excessive use of tea, coffee, and tobacco. The consideration of muscular exercise in this and in other etiological relations is, at this present moment, timely. Public interest is now much directed toward athletic attainments. Young men, and even young women, are stimulated to competition in various feats of muscular strength and endurance, such as running, walking, swimming, lifting, rowing, and gymnastics of various sorts. These attainments have become a very

prominent feature of the collegiate education of the present day. Believing, fully, that, irrespective of evils pertaining to the mind, this excessive devotion to muscular acquirements is fraught with danger to the body, we repeat, the consideration of the pathological consequences in the latter aspect is timely. According to athletic exercises not a small measure of importance in both their mental and physical influences, provided they are kept within judicious limits, we deem it a duty to bear testimony against their being carried to excess as is often done; and among the evils of this excess is functional disorder of the heart.

Does prolonged "strain and over-action of the heart" lead to organic disease, that is, to enlargement? The cases reported in this lecture, in addition to those heretofore published by Prof. Da Costa, show that not only long-continued muscular exertions, but protracted over-action of the heart from mental causes, or from the abuse of tobacco, may lead to enlargement. Admitting this, in order that we may not be led to over-estimate the importance of strain and over-action in this relation, namely, as causative of organic disease of the heart, two things are to be borne in mind: First, enlargement of the heart, occurring independently of valvular lesions, emphysema of the lungs, or renal disease, is extremely infrequent, whereas, functional disturbance of the heart, more or less great and continued, is quite frequent. Hence, the instances of organic disease dependent on strain and over-action must be very rare. Second, a moderate enlargement of the heart, existing without valvular lesions, is not a grave affection. With reference to the latter proposition, it is to be considered that the boundary line between the maximum of the normal volume of the heart, and an abnormal increase of volume, is not easily determined. If the largest heart, within the limits of health, were to be contrasted with the smallest, the difference would be considerable. Here is a liability to error in the interpretation of physical signs. When the signs give evidence of a large heart, is it too large to be embraced within the range of healthy variations? Assuming it to be so, it by no means follows that the condition is one of gravity, except as regards the liability to progressive enlargement. And, with regard to this liability, the fact of enlargement is obviously of importance, especially with reference to the removal of causes, on the continued operation by which the progress of the enlargement depends.

The pathological connection between "strain and over-action" of the heart and organic disease, is a subject claiming further study. Prof. Da Costa has rendered a valuable service by the facts and considerations which he has presented in this lecture, and in previous publications. The accumulation of additional clinical facts relating to the subject is highly desirable. A. F.

ART. XXI.—*Essays on Conservative Medicine and Kindred Topics.* By AUSTIN FLINT, M.D., Professor of the Principles and Practice of Medicine, and of Clinical Medicine, in Bellevue Hospital Medical College, New York. 12mo. pp. 214. Philadelphia: Henry C. Lea, 1874.

THE first of the three essays on Conservative Medicine, which form the principal part of this little volume, was published in the November number of the *North American Medico-Chirurgical Review* for 1861. The other two originally appeared in January and October, 1863, in this Journal, and with these our readers are doubtless familiar. The essays on Kindred Topics are

five in number, and were written for different occasions without any expectation—we are told in the preface—of their being associated in a volume; a fact to which the author appeals to explain the repetitions which occur in them. They were all read before medical bodies, with the exception of the last, which is entitled “Divine Design as Exemplified in the Natural History of Diseases,” and which was prepared for a popular audience—the Young Men’s Christian Union of Louisville, Kentucky. It is an attempt to show that the beneficence of providence is manifested even in the infliction of sickness and suffering upon the human race.

By conservatism in medicine Dr. Flint means “that principle which leads the practitioner, in dealing with diseases, to preserve, develop, and support the vital powers. The conservative physician shrinks from employing potential remedies whenever there are good grounds for believing that diseases will pursue a favourable course without active interference.” He is, however, as little chargeable with timidity as with over-boldness, and is prepared to resort to active therapeutic measures when convinced that they are indicated, even carrying a lancet, although it will probably be found to be rusty from want of use. In other words, a conservative physician is one who, being well instructed in medical science, and blessed with a fair share of intelligence and common sense, does not adhere “to principles and rules of practice on account of antiquity, authority, or usage.”

The use of the word conservative, in a sense so different from that in which it is usually employed, does not seem to us to be a happy one; and so little has it found favour that we should be afraid its application, without explanation, to any particular physician, would be regarded as a doubtful compliment. The term conservative surgery has been generally accepted, because its aim is to save rather than remove parts of the body, but, inasmuch as life is sometimes lost in the attempt, this is not a reason for designating as conservative a plan of treatment in which the sustaining of the powers of life forms an essential part. He attributes the change which has taken place in medical thought in this country, during the last half century, very much to the influence of a few New England physicians, dating the change from the publication of an address by Dr. Jacob Bigelow, of Boston, in 1835, on the self-limited character of certain diseases. Unquestionably this address must have had an immense influence upon the thoughtful members of our profession, but we trust it will not be attributed to an intensity of local pride, if we claim for Philadelphia some share, if not priority, in the production of this change. As early as 1812, Dr. Joseph Parrish, familiar with the success which had attended Dr. North’s treatment of spotted fever by stimulants and tonics, abandoned the use of spoliative remedies in typhus fever, during the epidemic prevailing at that time. His success in the management of cases of this disease was so great that it influenced his practice ever afterwards, and through his teaching left its impress upon that of the profession, not only here but throughout our country. In fact in a memoir, written by Dr. G. B. Wood,¹ he is described in terms very similar to those which Dr. Flint uses when speaking of what constitutes the conservative physician.

The essays on kindred topics are entitled: 1. Medicine in the Past, the Present, and the Future; 2. Alimentation in Disease; 3. Tolerance in Disease; 4. On the Agency of the Mind in Etiology, Prophylaxis, and Therapeutics; and 5. Divine Design as Exemplified in the Natural History of Disease. We have left ourselves too little space to notice these as fully as they deserve. They all

¹ Introductory Lectures and Addresses, 1859, p. 424.

have interest and importance to us as members of the medical profession; being the utterances of one of the most distinguished and successful physicians this country has produced, and they are worthy of their source. In the essay on alimentation in disease he urges the importance and necessity of a liberal supply of food to patients suffering from febrile or wasting disease, regarding their disinclination for it as no greater contraindication to its use than their insensibility to over-distension of the bladder would be a reason for neglect on the part of the physician to relieve this condition. He calls attention to the fact that even where there is a positive repugnance for food it is generally retained and digested. These essays, the work perhaps of Dr. Flint's leisure hours, give us an insight into the principles which guide him in the practice of his profession, clearer perhaps than that which is derived from his systematic writings.

J. H. H.

ART. XXII.—*On the Origin and Development of the Coloured Blood-Corpuscles in Man.* By Dr. H. D. SCHMIDT, New Orleans, La. Read before the Royal Microscopical Society (London), January 7, 1874. Reprint from the Monthly Microscopical Journal, of London, February 1, 1874. 8vo. pp. 23.

THIS meritorious effort to solve one of the already venerable problems, respecting the human red blood-corpuscles, seems to have been the result of a wise determination to utilize, as far as possible, the very young products of conception, procured by the writer, for investigation into the history of the nervous system.

In examining a fresh human embryo about one inch in diameter, Dr. Schmidt found that a minute fragment, snipped out from the wall of the umbilical vesicle (?), was composed chiefly of very large, clear hexagonal cells, with large round nuclei, supported by a delicate fibrous stroma, arranged so as to form fine canals, ramifying through the substance of the membranous wall. These canals were filled with embryonic red blood-corpuscles, many of them similar to the red disks of adult life, but a minority made up of "breeding or mother-corpuscles," ranging in diameter from about $\frac{1}{800}$ to $\frac{1}{1200}$ of an inch, containing from one to four embryo blood-disks, and, furthermore, distinguished by certain regularly-formed concave depressions on their surface, corresponding to the segments of spheres.

Our author remarks in regard to these mother-corpuscles: "So far as I am able to judge from careful examination of these bodies, as well as of others taken from older human embryos, their process of multiplication consists therein, that in [in that within?] the substance of the mother-body, and near its surface, the separation of a small portion, globular in form, takes place, which represents the embryo blood-corpuscles. Enlarging at the expense of the mother substance, this makes its way to the surface, and finally detaching itself, leaves behind a concave depression corresponding to its form."

By a tissue of ingenious reasoning, largely composed of observed facts, held together, however, by a moderate *stroma* of hypothesis, Dr. S. further endeavours to show that these "mother blood-corpuscles" are identical with the large round nuclei, of the very large hexagonal cells, composing the follicles in the wall of the umbilical vesicle as above described. To the follicular or gland-like structure of these vesicular parietes (similar to that recently demonstrated by Klein in the omental peritoneum), which Dr. Schmidt has discovered, he

attributes, therefore, the gland-like *function*, of producing the "mother blood-corpuscles," so long known as the nucleated red blood-globules of early fœtal life, and which he believes subsequently give birth to the biconcave disks which alone are found in the adult organism.

These results, contradictory as they are to the conclusions of Kölliker, Klein, Balfour, and others, in regard to the origin of the red corpuscles of the blood, can hardly be accepted as proved, until corroborated by other investigators, but, coming as they do from an observer well known for patient and accurate research, we commend them to microscopists generally as well worthy of careful attention.

J. G. R.

ART. XXIII.—*Electro-Therapeutics.*

1. *Electro-Therapeutics: A Condensed Manual of Medical Electricity.* By D. F. LINCOLN, M.D., Physician to the Department of Diseases of the Nervous System, Boston Dispensary. Philadelphia: Henry C. Lea, 1874.
2. *Clinical Researches in Electro-Surgery.* By A. D. ROCKWELL, A.M., M.D., Fellow of the New York Academy of Medicine, Electro-Therapeutist to the New York State Woman's Hospital; and GEORGE M. BEARD, A.M., M.D., Fellow of the New York Academy of Medicine, Electro-Therapeutist to the Demilt Dispensary. New York: William Wood & Co., 1873.
3. *Treatment of Nervous-Rheumatic Affections by Static Electricity.* By Dr. A. ARTHUS. Translated from the French by J. H. Eldridge, M.D., Professor of General Therapeutics, Rush Medical College, Chicago. Chicago: W. B. Keen, Cooke & Co., 1874.

1. ELECTRICITY, as a remedial agent, does not seem to lose the confidence of the profession, except when too much is claimed for it. For many years it remained a neglected aid, but has latterly been rapidly advanced by scientific zeal, and is now regarded with general favour. Electro-therapeutists are, however, prepared for disappointments, while not surprised at unexpected, or even startling successes.

"Those who, on the one hand, believe that electro-therapeutics is the one great problem of the future, and those who, on the other hand, suspect that it is all a delusion, will be equally disappointed."¹

It is, as usual, the middle path in which truth travels. At present, too, the tendency is to accept clinical results in this branch of therapeutics even when obtained in apparent opposition to established laws of electro-physiology. Seeming discrepancies it is hoped will be explained with an increased knowledge of electricity and morbid processes. In the words of Dr. Lincoln:—

"It can hardly be necessary to urge upon the reader the inestimable value of having a truly scientific basis for our therapeutical researches. Physiology, however imperfectly known, must be accepted as the best guide we possess; it is a better guide than bare conjecture; and all true progress in therapeutics must bring our practice into increasing harmony with the known rules of healthy and diseased action in the organs of the body."

Dr. Lincoln's work is what it purports to be, a "condensed manual." With the rules for practice there is also a crowd of theoretical views gathered from

¹ Clinical Researches in Electro-Surgery.

the best authorities, both conflicting and coincident, as are at present the opinions of men who use electricity to much advantage and who are eagerly and conscientiously observing its phenomena. The work is also a manual and of a convenient size for reference. The busy practitioner who wishes to refresh his knowledge from a ready source will find here in small compass the present prominent views concerning the principles and practice of electricity.

2. Beard and Rockwell meet "the objection that is often and very properly brought against the early publication of clinical experience, that it is apt to teach either absolute error or half truths" by explaining that this

"need not apply, provided the reports are fairly and impartially made, without any attempt to conceal or distort, or in any way warp the evidence to sustain a theory, and no inferences are drawn beyond the requirement of the demonstrator's facts. Cases of absolute or approximate success have been placed side by side with cases of absolute or approximate failure. Cases where every opportunity was afforded for treatment, and cases that failed for lack of opportunity, have been accorded equal prominence. Cases in which the ordinary and accepted methods of treatment would have been sufficient have been mingled with those cases which, under the ordinary and accepted methods, would have been utterly hopeless."

Some of the cases reported are very interesting, and will be found especially so to those who are experimenting in a similar manner.

3. Those who are doubting as to the effects of static electricity, and yet would have their faith strengthened even by uncertain props, will find much comfort in the enthusiastic sentences translated from the French work of Dr. Arthius. The conclusions are far more favourable to this method of application than those attained by other experimenters. Too much seems demanded, unless other observers are wrong, and one's gorge rises, granger-like, against a spirit of monopoly, which, with rare temerity, stretches its possessive pronoun over one vast domain of the ubiquitous fluid, and claims it as "static electricity—our electricity." It were a "consummation devoutly to be wished," that one-half might be accomplished by the healing influence of electricity which, with a hope perhaps prophetic, is anticipated by its friends. At present there are barriers in the way, but we have reason to believe that our knowledge both of the science and art is still very crude and incomplete.

F. A. B.

ART. XXIV.—*Report of the Board of Health of the City and Port of Philadelphia, to the Mayor, for the year 1873.* 8vo. pp. 255.

WE learn from this report that the health of Philadelphia has been generally good. The year 1873 has proved to be unusually free from epidemic diseases. The summer heats of July were far less oppressive than in 1872, and young children did not furnish so large a mortality as before.

The Board adverts to the imperfection of the returns of births, and mentions with approval the system, pursued in some cities, of house to house visitation for collection of these facts. We fear that no other method will prove effective in this country.

The exemption of Philadelphia from contagious diseases, during the year, is well shown by the figures exhibiting the admissions into the Municipal Hospi-

tal. Only forty-four were received against nearly fifteen hundred the previous year.

The very great diminution of applications for vaccination, since the subsidence of the epidemic prevalence of variola, is adverted to with regret, and as indicating the necessity for bringing to bear upon public indifference and neglect some stronger influences than now prevail. Whether any means short of compulsion will suffice, is a question upon which the Board does not take a very decided stand.

In regard to our water supply, the report urges the abandonment of the present Delaware works, and the establishment of new pumps above Tacony. The enforcement of existing laws for the protection of Schuylkill water from pollution at Manayunk and Falls Village is earnestly demanded.

The great need of public baths is referred to. It surely is a crying shame that it is necessary to call attention to this matter year after year.

In regard to intra-mural interments, several pages are quoted from English parliamentary reports. The views taken seem to us rather extreme, when applied to any condition existing or likely to exist in our city. But it is better to err on the side of safety and over-caution than to run any possible risk. The establishment of mortuaries, within the city, to which the funeral escort might convey the dead, and from which they should be quietly removed to extra-mural cemeteries, is recommended for the benefit of the poor and people of moderate means.

Those who sometimes feel a little disposed to complain because the Board does not secure a perfectly clean and spotless city, may yet find reason to rejoice and be thankful when they read the record of the nuisances which its officers have abated. We believe that much good would result if citizens, instead of abusing the Board in the papers in general terms, would make formal complaint as to the particular evils which come under their notice.

Complaint is made that the Board has not sufficient power legally to compel the demolition of tenements in certain districts. Nothing short of entire removal of the buildings in some localities can satisfy the hygienic requirements.

The organization of grand abattoirs is advised in place of the hundreds of small establishments which now exist.

We earnestly hope there may be no delay in carrying out one recommendation of the Board, viz., the use of the improved pneumatic apparatus for emptying cesspools. The present primitive and obscene method is simply disgraceful.

The low death-rate of the city is regarded with some satisfaction. The roomy accommodation afforded to the poor—itsself the result of the topographical peculiarities of the site—is, we believe, more to be credited with the low mortality than is any very prevalent attention to the laws of health on the part of the population. As it is, the mortality is but slightly less than that of London, where the drinking water is very bad, and abject poverty vastly more common.

A suggestion is made that the water used for sprinkling the streets should be impregnated with cheap chlorides, as a sanitary precaution.

It is claimed that, upon the whole, the street-cleaning has been fairly done, and better than in 1872. There is no doubt of the truth of one point here mentioned—it is impossible to keep decently clean the wretched apologies for pavements which disfigure most of the streets of Philadelphia. As to the prevailing tendency to cast all manner of rubbish into the streets, to obstruct these, and to tolerate their obstruction by others with building materials, *débris*, earth from cellars, lumber, old wagons, and cumbrous matters whose

owners have no convenient storage room for them—these evils, we fear, indicate a great lack of proper public spirit and honest local pride.

The absolute number of marriages registered is greater than in any preceding year, though in proportion to population slightly less than in the three years 1864, 1865, and 1866. Nothing is said as to the degree of confidence to be placed in the correctness of the record.

The number of births reported is larger than ever before. Concerning this branch of the registration, it is confessed that the returns are sadly imperfect. Inquiry from door to door, as has recently been successfully practised in Boston and Providence, is recommended by the Board as the only trustworthy method of gaining the full facts. An unusual proportion of male infants continues to characterize the births of Philadelphia. In 22,000,000 English births, male children exceeded female in the ratio of 104.8 to 100. Here, for thirteen years, the ratio has been 109 or 110 to 100. This marked predominance is by some deemed to be an indication of a prosperous and healthy social condition.

The mortality of the year was not far from the average. As compared to that of 1872 it was considerably less, owing principally to the moderation of the summer heat. As usual, July stands at the head of the months in the order of mortality.

The great number of deaths among young children remains a matter of the most painful interest. True, indeed, the ravages of cholera infantum have been less terrible than before. But we fear this partial relief was due more to atmospheric causes than to intelligent care. Still we heartily sympathize with the Board in the belief that the "children's excursions," and the "rules for the management of infants," may have saved many lives. The suggestion of the Board that summer homes for sick children be established, has already been adopted on a small scale, and has proved as salutary as could possibly have been anticipated.

Cerebro-spinal meningitis, we notice, prevailed to nearly three times the average extent for ten years. The deaths were 246, nearly 60 per cent. being children under ten years, and one-half occurring in the second quarter.

The vital statistics of this report are exhibited in the usual variety of forms. The tables seem intelligently arranged, and not unfairly interpreted. We are glad to see that the meteorological facts of the year are presented, both by themselves and in connection with various diseases.

An attractive as well as useful feature in the volume is the use of coloured charts, to show to the eye the comparative rise and fall of mortality by particular diseases—and in some also the variations of temperature, pressure, and humidity—throughout the months or weeks of the year. These are admirably designed by Dr. Ford, and well executed.

The longest mortality table—analyzing deaths according to character of disease—is a little obscure at first sight. Instead of going through the whole disease-list according to sex and age, and then again according to nativity and wards, these different exhibits occupy alternate pages.

Many of the tables present facts which are very curious and interesting, but for which we must refer our readers to the work itself.

Two appendices close the volume. The first is the report of the Municipal Hospital; and the second is the original report of registration facts, presented to the Board, and from which the main report is made up. Owing to a fortunate exemption from contagious diseases, the former deals with very small numbers, and the latter calls for no especial mention.

The report is well and correctly printed, and every way creditable to the City and to its compilers. Dr. Ford deserves the thanks of the profession, as well as those of the public, for producing such good work.

B. L. R.

ART. XXV.—*On Hospitalism and the Causes of Death after Operations.* By JOHN ERIC ERICHSEN, F.R.C.S., etc. Small 8vo. pp. viii., 107. London: Longmans, Green & Co., 1874.

It is now about five years since the late Sir James Y. Simpson stirred up the wrath of British surgeons, by his wholesale indictment of hospitals as being "banes rather than blessings" to society, and it is more than two years since in the pages of this journal we endeavoured to investigate the truth of his charges, and to show how little his accusations could bear the test of critical examination. Mr. Erichsen, himself (as our readers know) a hospital surgeon of large experience, has lately revived the term "Hospitalism," though in a somewhat modified form, and we have looked with a good deal of interest over the four lectures which he has collected in the small volume now under consideration, to see what, if any, new light he might have thrown upon the subject, and what means he might have had to suggest for the prevention of that large mortality after operations which every operator has to deplore.

"By 'Hospitalism' I mean," says Mr. Erichsen, "a septic influence capable of infecting a wound or of affecting the constitution injuriously."

This septic influence he believes to result from "over-crowding," which he explains to be not necessarily the placing of more patients (numerically) in a ward than it should receive, but the aggregation of a disproportionately large number of severe and, particularly, of suppurating wounds. Mr. Erichsen's facts probably will not be disputed. Of course a ward containing on an average twenty cases of compound fracture, will, in a year, furnish more deaths from pyæmia than a similar ward which habitually contains but ten cases of compound fracture and ten of simple fracture, and more than this, the first or "over-crowded" ward will probably furnish a larger number of deaths proportionately; pyæmia is itself, in a certain sense, probably contagious, and erysipelas and hospital gangrene (which often lead to death *through* pyæmia) are undoubtedly so, and it is no matter of surprise therefore that, where plenty of pabulum exists in the way of depressed constitutions and open wounds, one of these affections accidentally introduced should spread more destructively than where the suitable material is wanting.

But this is, to our mind, no argument against *hospitals*, but against hospitals which are *badly managed*. If the pressure upon the resources of a hospital is so great that all "walking cases" have to be excluded, and that even patients with broken legs or thighs must be bundled up in starched or plaster of Paris bandages and turned off to be treated as out-patients, no doubt those who are so severely injured that they *must* be taken in, will have less chance of recovery when crowded together, than they would have had if judiciously distributed through the wards of a larger or less busy hospital. And the proper remedy is obviously not (as Sir James Simpson suggested) to tear down our present buildings and substitute "wooden, or brick, or iron villages," but to enlarge the hospitals now existing, or, where this cannot be done with advantage, to build new ones with all the hygienic improvements which modern science has indicated; and to educate the authorities of hospitals to the conviction that it is not the highest praise of a surgeon to have operated on the largest number of severe cases, but to have done the greatest good to the greatest number of patients, and to have saved the largest number of lives.

Mr. Erichsen's suggestions, as to the means of diminishing mortality after operations, are judicious as far as they go, and consist essentially in enforcing

cleanliness and avoiding "over-crowding." We think he hardly attributes sufficient influence to the constitutional condition of patients before and after submitting to an operation, and to the consequent importance of suitable hygienic and constitutional treatment; in this respect we think the teaching of the author's "Science and Art of Surgery" better than that of the volume now under consideration.

Although Mr. Erichsen has revised these lectures since their first appearance in the English journals, there are some marks of hasty composition still apparent; we would particularly instance the sentence at the foot of page 19, which, taken as it stands, implies that the author has never known pyæmia to occur after a compound fracture, except when the limb has been amputated.

J. A., JR.

ART. XXVI.—*Recent Works on Cholera.*

1. *Report on the Cholera Epidemic of 1872, in Northern India.* By J. M. CUNNINGHAM, M.D., Sanitary Commissioner with the Government of India. Quarto pp. 150. Calcutta: Office of the Superintendent of Government Printing, 1873.
2. *A Report of Microscopical and Physiological Researches into the Nature of the Agent or Agents producing Cholera.* By T. R. LEWIS, M.B., Assistant Surgeon H. M. British Service; and D. D. CUNNINGHAM, M.B., Assistant Surgeon H. M. Indian Service, attached to the Sanitary Commissioner with the Government of India. 8vo. pp. 112. Calcutta: Office of the Superintendent of Government Printing, 1872.
3. *Observations on the Pathology and Treatment of Cholera. The Result of forty years' Experience.* By JOHN MURRAY, M.D., Inspector-General of Hospitals, late of Bengal. 12mo. pp. 58. London: Smith, Elder & Co., 1874.

The same. New York: G. P. Putnam's Sons, 1874.

THESE three books all treat of cholera, and although they differ materially in the point of view from which they regard the disease, they will be most conveniently considered together. The first on the list is an admirable report by Dr. J. M. Cunningham on the cholera epidemic of 1872, in Northern India, the total mortality from which in the provinces under British rule reached 165,458. The book contains a fine map of India, showing the localities which suffered in the epidemic, and is divided into two parts. In the first, questions of a general character connected with cholera are discussed; the second contains notes of the various outbreaks of the disease, arranged in seven different sections, as follows: Section I. contains a very few words of description of the place where the outbreak occurred; in No. II. are given details of the outbreak; in No. III. are related all the facts bearing on the question of importation and communication; No. IV. is devoted to the little information obtainable in regard to the meteorology; No. V. contains a short account of the local conditions, including the water supply, the drainage, ventilation, overcrowding, and the like; No. VI. describes the preventive measures adopted and their apparent results, and No. VII. embraces the statistics, in tabular form, concerning the history of the place as regards cholera in former epidemics. In addition to this there are several other tables, showing, 1st, the distribution of the deaths from cholera through the different provinces of India; 2d, the degree to which different regiments suffered in the epidemic; and 3d, the number of cases

occurring in the jails of the Bengal Presidency. As there were one hundred and eight of these outbreaks, it will readily be seen that this part of the book contains a vast deal of valuable information.

As we have said, the first part of the report is of a more general character, it being given up principally to the discussion of such subjects as the following: 1st. The contagiousness of cholera. 2d. The influence exerted by human intercourse in its propagation. 3d. The part played by drinking water in disseminating it. 4th. The effect in preventing this of isolation and of quarantine. The conclusions which Dr. Cunningham draws from his observations in regard to all these points are at variance with the opinions most generally entertained. He thinks, in the first place, that the contagiousness of cholera is not proven, in fact it is perhaps nearer the truth to say that he does not believe it to be at all contagious. In support of this view, he shows that the medical and other attendants upon the sick did not suffer in a larger proportion than any other class. Of all the medical officers in public employ, not one was attacked except an assistant surgeon who was suffering from dengue, and had not attended a single case of cholera. The attendants very often escaped altogether. For example, of forty native attendants at Fyzabad, none were attacked; not one of the large number employed with the different regiments at Lucknow; not one out of seventy native servants at Dugshaie; not one at Jullundur. In those cases in which the attendants did suffer, and there were many such in the outbreaks reported by the author, he ascribes the seizures rather to the locality in which the men lived than to the fact that they were brought in contact with cases of the disease, maintaining that they enjoy an entire immunity when the sick are removed from the infected locality. As a further argument against the contagiousness of the disease, the author adduces the fact that the number of persons attacked in the same town or city during different epidemics varies considerably even where all the surrounding conditions are favourable to the spread. In 1869, no less than 60,000 deaths from cholera took place in the Central Provinces. In 1870, the number was 107. In 1871, it was only 19. In 1872, it rose to 1592. It is always a difficult matter even in dealing with a disease which is confessedly contagious, to determine in particular instances how much influence in causing the attack is owing to locality and how much to contagion, and we have no doubt that the sudden outbreak of cholera in a house, barracks, or camp, is frequently much better explained by reference to the former than to the latter. Still we are not prepared to leave contagion entirely out of the question. Dr. John Murray, in a critical review of this report,¹ asserts that if nurses have escaped in some places they have suffered severely in others, and that a careful review of the statistics will show that this class furnishes quite as many, if not more, cases than any other. The reports of civil hospitals in Paris show that during the late epidemic there, out of 291 cases treated for cholera, 100 occurred in patients in the hospitals. It is true this may be nothing more than a coincidence, but inasmuch as it is not an isolated instance, we are inclined to believe that it is something more.

Very closely connected with the question of the contagiousness of cholera is that of its propagation by human intercourse, and we find that here again Dr. Cunningham takes the negative side. The disease, he says, could not be traced to importation in one of one hundred bodies of troops, prisoners, and other communities which were made the subjects of careful medical observation. He avers that there is positive evidence that the disease did not spread by pilgrims returning from Hurdwar Fair in 1872, and so far from this fair having been in other

¹ British Medical Journal, January 17, 1874.

years the great centre from which cholera radiated, it has been singularly exempt from it. In 1783, there was a severe outbreak, but this is the only mention of cholera in the early years. In 1857, the pilgrims suffered; but with this exception the disease appears to have been unknown among them from 1854 to 1866. In 1867, there was a great outbreak which has been described in the Fourth Annual Sanitary Report. From 1867 to 1873, the annual fairs have passed without any sickness beyond one or two isolated cases. Again, there is no evidence that the disease was carried or disseminated along the great lines of communication. On the contrary, it spread through provinces in which there are no railways, and in which the amount of traffic is small. Moreover, the rate at which the disease progresses is not more rapid now than it was formerly before the introduction of steam communication. But, perhaps, the most remarkable fact remains to be told. The disease appeared among the boys at St. Peter's College, at Agra, on the 5th of July, and with such violence that by midnight there had been 21 cases and 6 deaths. By the 10th, when it ceased, there had been altogether 63 cases and 34 deaths out of a strength of 176. On the 6th of July, 65 of the boys were sent to their friends, either in Agra or other stations, some of them very distant, and yet in no instance did one of the 65 boys, so dispersed over the country, communicate the disease to the homes into which they were received. This is all the more remarkable because 12 of them were attacked after reaching their destinations, and 5 died, and in not a few instances the overcrowded rooms, occupied by large families into which they were admitted, were most favourable for the spread of cholera. It is only proper to add, that the correctness of some of the statements in regard to the Hurdwur and other fairs have been impeached by Dr. Murray in the review to which we have previously referred.

Dr. Cuninghame assails very energetically the theory that the spread of cholera depends in any degree upon the use of drinking water polluted by cholera evacuations, supporting his position by several arguments which have certainly a good deal of weight, such as the following: 1. Medical officers in charge of troops, among whom an outbreak has occurred, almost invariably express the opinion that no connection can be established between it and the water supply. 2. The geographical distribution of the disease is opposed to any such view. 3. In the whole course of the epidemic there was not a single instance in which the cessation of the disease could be attributed to the disuse of any particular water. 4. The difficulty of accounting for the almost simultaneous disappearance of the disease in different regiments and other communities on this theory. 5. The number of cases occurring do not bear any proportion to the degree to which, accepting the theory, the water may be supposed to be contaminated. "In Lahore City, for example, taking the number of deaths shown in the registration returns to represent half of the number of attacks, 10 cases in June produce 86 in July, while 476 in August produce only 10 in September, and such is the history of the disease not in a few places only, but all over the country. In order to account for the results according to the water theory, the accidental pollution of the many sources of water supply is supposed to occur at the commencement, just at the very time when it is of all others least likely to occur." This theory will not account for the fact that, in one outbreak at least, the native troops almost escaped, while the European suffered severely, both drinking the same water. In the epidemic at Peshawur the Royal Artillery at the end of the stream, where the pollution would naturally be greatest, escaped almost entirely. The history of the outbreak at St. Peter's College to which reference has already been made, is also opposed to this theory. "The water used by the boys," to quote from

the report, "was drawn from a well common to the college and a considerable native community, among whom so far as is known no cases occurred. It may be argued, that, although nominally drawn from this source, in reality it was very likely taken from the college well employed in former years—a well in most dangerous proximity to the old latrine, which is practically a well of filth close beside it. But this explanation accords with the facts no better than the other, for the day boarders, 27 in number, who drank of the same water as the boarders and orphans, and drank largely too—as I was assured, and as might naturally be expected in that very hot weather—all escaped with the exception of one. Anxious to ascertain the circumstances under which the boy was attacked, I found, on inquiry, that he was the only one of the day scholars who lived close by—a fact which points strongly to localization, not to water." But the strongest argument that can be brought against this theory, is the fact that the disease has disappeared among troops who, continuing to draw their water from the same source as before, have moved their camp a short distance from the infected locality.

The next series of facts which Dr. Cunningham considers, are those relating to measures adopted for the prevention of the disease, and most important among these are quarantine and isolation. It will not surprise our readers to hear that he takes strong ground against the enforcement of either of these measures, believing that they have never been effective in arresting the spread of cholera, that they occasion great inconvenience to the people, and interfere with commerce, and that they prevent what is really the best of all prophylactic measures, the removal of troops or other bodies of men from an infected to a healthy locality. He insists upon the necessity for these removals, wherever practicable, to a considerable distance from the place where the disease has broken out. If this is impossible, a slighter change will frequently be sufficient to check the dissemination of the disease, although it will sometimes be found to fail. "The arguments against a general quarantine," he, however, adds, "do not apply to the discouragement of fairs and the diversion of streams of pilgrims at those times when cholera threatens, provided those measures are taken discreetly. The conditions under which pilgrims travel and congregate are essentially insanitary conditions, which favour the appearance and spread of disease, and in so far as these conditions are obviated good will occur, both to the pilgrims themselves and the community generally."

Nor is he disposed to overlook the advantage to be derived from carrying out all sanitary reforms, insisting upon the importance of thorough drainage and ventilation as well as upon the necessity of improved means for the supply, and still more perhaps for the distribution of pure water.

We have placed these views of the author before our readers with very little comment of our own. We cannot refrain from expressing our agreement with Dr. Murray in his opinion, that an official report such as the one under review, in which it is maintained that cholera is not contagious, will certainly have a tendency to render people careless in carrying out the necessary hygienic measures to prevent its spread.

2. The report of Dr. Lewis and Mr. Cunningham is divided into three parts: the first containing a description of the microscopical appearances of the blood in cholera; the second giving an account of a series of experiments on the action of solutions of organic matter from various sources and in various stages of decomposition on living animals; and the third, on the effect of section of certain nerves. The observations which have been recorded are reliable because no observation has been included which has not been witnessed by both of the experimenters.

The observations on the blood were made immediately after its removal from the body and from day to day for some time thereafter. For purposes of immediate examination, specimens of blood were placed under thin covering glasses, individual specimens being prepared without any reagent, mounted in acetate of potassa, after exposure to the vapour of a two per cent. solution of osmic acid, or mounted in acetate of potassa or acetate of soda without previous exposure to the osmic fumes. When this was done the red corpuscles appeared unaltered in most cases; and but few leucocytes were present. Not the faintest trace of bacteria was detected in any instance, although they were carefully searched for under powers varying from the $\frac{1}{4}$ to the $\frac{1}{2}$ *à immersion*. There were, however, as a rule, numerous specimens of minute irregularly rounded bodies having a refraction like that of leucocytes, and varying considerably both in size and form; they occurred sometimes in patches or heaps, and in other cases were irregularly scattered over the fields. No structure could be detected in them, and they appeared to be mere fragments of bioplasm.

For continuous observations on the changes taking place in the blood after its removal from the body, wax-cells were employed. A small drop of blood having been received on the centre of a carefully-cleaned covering-glass, the latter was pressed down on the wax-cell and hermetically sealed. The cell was deep enough to prevent the blood from coming in contact with the slide, and therefore allowed its free exposure to the included air. The fragments of bioplasm observed in fresh blood were also noticed in these preparations, and were seen to grow larger, to undergo various changes in form, and to be endowed with the power of motion and of multiplication. Later these movements ceased, and they then resembled in refractiveness and general aspect pus-cells, in which the vital movements have ceased. Still later the bioplastic masses broke up into molecular flakes which might very readily have been mistaken for flakes of monads, and might have been supposed to arise by aggregation, had the processes by which they were formed not been followed out. These bioplastic bodies are supposed to be the origin of those found in the evacuations of cholera-patients, an opinion which is corroborated by the fact that the presence of red blood corpuscles in the stools renders it certain that blood escapes into the intestines in cholera. It is true that similar bioplastic bodies are observed in the blood of health, but not in anything like the same number. So that the authors confidently assert, that, given two samples of blood, one being choleraic and the other healthy, although to the naked eye, or at first sight under the microscope, no difference might be discovered, they could pretty accurately state on the second day to which of the two sources the specimen should be referred.

In regard to the relative frequency in which low organisms are present in healthy blood and in that of cholera-patients, the authors say that in 22 specimens of healthy blood examined some days after removal from the body, distinct evidence of monads or bacteria were only once observed and fungal filaments only appeared on three occasions, or at the rate of about 13 per cent. In the blood of cholera-patients obtained during life, but kept in wax-cells for a few days, monads or bacteria were only observed on two occasions in 39 specimens, and fungi were seen to develop in six preparations, just two per cent. more than in healthy blood, and in every instance but one, the fungus was observed to have entered the preparation from without. The absence of these low forms of life is equally conspicuous in the preparations of cholera-blood obtained after death.

The second part of the report contains a detailed account of a series of ex-

periments on the introduction of organic fluids into the system, classified as follows: 1. Experiments on the injection of pure cholera-fluid into the veins of animals; 2. Injections of aqueous solutions of choleraic material into the veins of animals; 3. Injections of organic solutions other than of choleraic nature into the veins of animals; 4. Experiments on the introduction of choleraic and other solutions into the peritoneal cavity of animals. Dogs were the subject of these experiments. In thirty-two experiments of the first class in which the material used was either fresh or had been kept for varying lengths of time, sixteen deaths occurred; thirteen evidently from the direct action of the putrefying material exerted through or upon the blood; two apparently from shock, and one dog was killed owing to erysipelatos inflammation of a severe kind attacking the wound. These are consequently left out of the calculation. The mortality, therefore, resulting from the direct introduction of choleraic dejections in quantities varying from two to six drachms may be set down as amounting to about 43 per cent. Of seven cases in which the choleraic material injected into the veins had been more or less diluted with water, two died, which is equal to about 35 per cent. There were twenty-one experiments, on the introduction of solutions of ordinary alvine discharges carried out; nine of the animals died; three of these deaths were attributed to shock, which, for the sake of uniformity, was also left out of the calculation, thus leaving six deaths, or a mortality a little over 33 per cent., about 2 per cent. less than the mortality from the injection of the diluted choleraic material. Twelve experiments on the effect of injecting the peritoneal cavity with solutions of organic materials are recorded. In four of them choleraic material was used. In the others ordinary alvine discharge, decomposing solution of beef, and peritonitic fluid, recent and decomposed, were injected. Deaths only occurred in three cases, namely, two after the introduction of a fluid which had just been obtained from the peritoneal cavity of another dog, and one after the introduction of a solution of decomposing ordinary alvine discharge. The remaining dogs were all killed within twenty-four hours of the operation, and all, whether they died or were killed, presented the same marked lesions at the autopsy. The most prominent and constant *post-mortem* phenomenon in all the cases, no matter in what way the putrefying substance had been introduced, was a sanguineous exudation into the small intestine, more or less evenly distributed over the mucous membrane, which, together with its epithelial coating, was intact. That portion of the intestine, a foot or two above the ileo-cæcal valve, which is more apt to be congested in cholera, escaped in almost every instance being materially affected. In fully one-half of those cases in which injections were made into the peritoneal cavity, pericarditis, more or less distinctly marked, was observed; that portion of the pericardial sac in immediate connection with the diaphragm, together with that immediately attached to the sternum, being the part usually affected. "Perhaps," the authors say, "the origin of this may be explained by one of the series of *observations on the anatomy of serous membranes* lately published by Drs. Burdon Sanderson and Klein, which shows that when various colouring matters are introduced into the abdominal cavity the lymphatic vascular system of the diaphragm becomes completely injected, as *also the sternal vessels and sternal glands*." It will be seen from the result of these experiments that it is not necessary to agree with Dr. B. W. Richardson, of London, that, because pericarditis follows the injection of lactic acid into the peritoneal sac, lactic acid is therefore the cause of rheumatism.

Although the injection of choleraic material and the organic matter into the veins produced lesions of the intestines, yet these differed from those found in

cholera, and the authors therefore performed a series of experiments, with the object of determining whether or not section of the splanchnic or mesenteric nerves would give rise to an increased secretion into the intestines. In all of the experiments but two, in which the mesenteric nerve was only partially divided, there was no hypersecretion of fluid. The two exceptional cases may perhaps explain, to a certain extent, the pathology of cholera, indicating that partial paralysis of the intestines is one of the most important lesions in the disease.

The book is illustrated by plates showing the changes occurring in preparations of the blood in cholera.

3. The results of observations which have extended over a period of forty years, when made by a physician who has enjoyed such exceptional advantages for the study of cholera as Dr. Murray has, ought certainly to possess great value, and it is therefore with a feeling of disappointment that we find, after a careful examination of his book, he has been able to add absolutely nothing to our knowledge of the pathology of this disease and very little in regard to its treatment. He believes, that the first stage of the disease is not, as is generally supposed, that of diarrhœa, but that preceding this there is a condition which may be generally recognized, and which he designates as *malaise*. In this stage the disease is very amenable to treatment, and it is consequently very important that this should be begun before the supervention of diarrhœa. We therefore regret that he does not describe the symptoms of this malaise so fully and clearly, that we should have no difficulty in distinguishing it from that which precedes the occurrence of almost every other disease, or from that which is simply dependent upon bodily or mental fatigue. Nor are the rules which he lays down for its management much more satisfactory. There is a clear indication, he says, to assist nature in promoting digestion by all ordinary means, aided by those that have been found useful under particular circumstances, and at various seasons. The feelings of the patients will often lead them to have recourse to ardent spirits, but while the use of these in moderation, or at meals, need not be interfered with, their use in excess is followed by depression, which predisposes the system to an attack of the disease. In fact, Dr. Murray regards stimulants as the cause of a good deal of mischief in cholera. The temptation to prescribe them is very great, especially during the stage of collapse, but if given in large quantities at this time they are very apt to increase the fever, and the head symptoms of the succeeding stage. It is better, therefore, to substitute them by the diffusible stimulant, the action of which is more evanescent.

The only rational system of treatment in cholera, Dr. Murray holds to be, that which affords the most hope that the poison upon which it depends will be eliminated from the body. It has been proposed to do this by the administration of purgatives, but increased action of the bowels tends to get beyond control, and to induce fatal collapse. He therefore endeavours to fulfil this indication by remedies which increase the secretions of the liver, lungs, and kidneys. With this view he recommends calomel in moderate doses, entertaining apparently no doubt of its power to stimulate the secretion of bile. He, however, condemns its use in large doses, when it of course acts as a purgative, and may do great harm. During the stage of collapse it will not be absorbed, and should not be given at this time, since the full action of the medicine will not unfrequently manifest itself as soon as reaction has been established. Quinia is another drug upon which he places much reliance, prescribing it in small doses in the stages of malaise and diarrhœa, and in large doses during collapse, just before reaction is anticipated.

The indications furnished by the different stages of cholera require to be met by different remedies, and we therefore shall probably use the space at our command to the best advantage, by considering these in the order in which they are presented. Thus in the stage of diarrhœa, the prescription which our author has found most useful is an anodyne carminative, composed of opium one part, black pepper two parts, and assafœtida three parts, divided into five grain pills, and given with a little cold water, after every second stool. This will be found to be more efficacious than one containing any of the pure astringents, such as gallic acid, acetate of lead, or sulphate of iron, which, while arresting the discharges, do not alter their character. During this stage, the disease sometimes assumes a distinctly periodical type, and is characterized by profuse cold perspiration. Here quinia is the sheet-anchor of hope, given in large doses, with opium two hours before the exacerbation is expected. When collapse occurs, the indication is to sustain the strength of the patient until it gives place to reaction. The intense thirst, which is a distressing symptom, is best relieved by small quantities of ice-water, given at short intervals, and medicated by the addition of an acid, as sulphuric or acetic, or by an alkali, as carbonate of ammonia or soda, according to the inclinations of the patient. An effort should be made to rouse the patient by the internal administration of tincture of camphor, ammonia, or decoction of red pepper, and by the external application of heat and the rubefacients. When food is given it should be in a liquid form, and the author speaks highly of a watery extract of meat, made by macerating beef in an equal weight of water to which a few drops of muriatic acid have been added. With the object of replacing the deficient secretions, he administered in some of his cases, and he asserts, with very good results, half a drachm of bile, and fifteen grains of pepsin. If the stomach rejects these remedies, the exhibition of hot saline enemata will frequently, he says, relieve the cramps and uneasy pains in the abdomen, and very often arrest the purging, and hasten the occurrence of the reaction. In addition to excessive purging, he condemns bleeding, the actual cautery, and also the use of chloroform, chlorodyne, and ether, which have a tendency to render the subsequent reaction violent. He has used morphia hypodermically with advantage in relieving pains and allaying vomiting, but he has seen little good follow the endermic exhibition of other remedies, except perhaps of quinia. It is scarcely necessary to add that he cautions us against allowing a patient in this stage to sit up, or to use any unnecessary exertion, as the syncope, which sometimes occurs under these circumstances, is not unfrequently immediately fatal.

We find nothing that is new suggested in the treatment recommended for the stage of reaction; our efforts being necessarily limited to the moderation of the fever with its attendant brain symptoms, and to the re-establishment of the urinary secretion. The remedies which he employs to promote these ends are chlorate of potash, digitalis, nitric ether, nitre, and demulcent and diluent drinks. Ice may be applied to the head, and in cases where vomiting is an annoying symptom may be administered internally, conjointly or alternately with effervescing draught or small doses of hydrocyanic acid. Particular attention is of course to be paid to the diet, and if all articles of food are rejected, an attempt should be made to nourish the patient by the rectum.

Dr. Murray's concluding remarks have reference to the hygienic measures which he thinks it proper to take during an epidemic of cholera. As the primary source of the disease is the human body, there is danger, he says, in its proximity and safety in its isolation. He therefore recommends that cholera patients should be treated in special hospitals or in the tents, and have special

attendants assigned them, except, of course, in cases where their position in life permit them to be isolated, and to be comfortably treated at home.

We have endeavoured in the above *resumé* of his treatment to do full justice to Dr. Murray, but we think the readers of this Journal will agree with us in thinking, his book contains nothing on the treatment of cholera with which they are not already familiar.

J. H. H.

ART. XXVII.—*History of the American Ambulance established in Paris during the Siege of 1870-71, together with the Details of its Methods and its Work.* By THOMAS W. EVANS, M.D., D.D.S., Ph.D., etc. London: Printed for the author at the Chiswick Press, and published by Sampson Low, Marston, Low & Searle, 1873. Imperial 8vo., pp. xxxviii., 694.

THIS large but beautifully printed volume is so large, so beautiful, and—in comparison with the medico-military volumes issued by the American Surgeon-General's Office—devoted to so very small a subject, that it may, without any feeling of disrespect, be called the GLUMDALCLITCH of military surgery. From the preface we learn that it is to form Vol. I. of Dr. T. W. Evans's "General History of 'Sanitary Associations during the Franco-German War of 1870-71,'" a work which (if every part is to contain as many words in proportion to the extent of its subject matter as this one) will rival in voluminousness those historical novels of which we hear that Oriental nations are so fond, and the concluding pages of which may be expected to appear at or about the time of the Greek Kalends.

The present volume contains four distinct essays, the first giving *An Account of the Formation of the American International Sanitary Committee of Paris, together with the History of the American Ambulance*, by Dr. EVANS himself; the second, consisting of three parts, (1) *On the Establishment of Army Hospitals*, (2) *On Tents and Tent-barracks*, and (3) *On the Special Organization of the American Ambulance*, by Dr. EDWARD A. CRANE; the third, *On the Surgical History of the American Ambulance*, by Dr. JOHN SWINBURNE; and the fourth, *On the Medical History of the American Ambulance*, by Dr. WILLIAM E. JOHNSTON. An appendix is added, giving a list of the persons who served in the American Ambulance, and an explanation of the Ground Plan of the Ambulance, which forms one of several large plates bound at the end of the volume.

Of the four essays, one only, that of Dr. Crane, has impressed us favourably; it, indeed, displays a great deal of antiquarian research, as well as of practical familiarity with the principles of hospital construction, and were it separately printed, in a portable and inexpensive form, would, we doubt not, be received with much favour, as furnishing really the best account of the origin and history of military hospitals which is accessible to the English-reading public. This essay deserves to be honourably excepted from the unmitigated censure which the judicious critic must bestow upon the rest of the volume.

Dr. Evans's own contribution to the work constitutes one of the most lamentable displays of vanity and self-glorification which we have ever met with. Its most salient features are the "huffiness" with which he tells how he and his associates were snubbed (and we confess, as it seems to us, not undeservedly) by the authorities of the United States Sanitary Commission in this country, and the ill-concealed satisfaction with which he lets the reader know that the

"illustrious Lady," who has lately resided at Chiselhurst, "entrusted her personal safety to him," and that "more than willingly he accepted all the responsibilities it involved. He suddenly left Paris, without giving a word of explanation to any one, and after a few days happily succeeded in conducting Her Majesty, in safety, to the more secure and peaceful shores of England"—where, moreover, the exigencies of war rendered it convenient for him to stay himself until the close of the conflict.

Dr. Swinburne's and Dr. Johnston's essays give an account of the actual amount of professional work done by the Ambulance, the former having had under his care 247, and the latter only 24 patients, a grand, or shall we rather say a small, total, of 271 cases, being a fraction more than one for every three pages of the big book in which their treatment is celebrated. Dr. Swinburne, after complimenting the "gentlemen volunteer aids" who, in selecting patients for him, "made it a point to seek and take in the most severely wounded, and particularly those having fractures," adds:—

"These facts explain why, among the 247 surgical cases treated at the Ambulance, there were 126 compound fractures. Notwithstanding this great number of fractures, and the causes previously enumerated, only 47, or a little over 19 per cent., have died of their wounds."

This statement appears to us somewhat liable to be misunderstood: in the first place, as we learn from a foot-note, the 126 fractures occurred in only 114 patients; and in the second place, of the 47 deaths, all but two occurred in cases of compound fracture; so that, although the mortality of the whole number of cases was but a little over 19 per cent., the mortality in cases of compound fracture was over 39 per cent., while the 133 patients who had not broken bones, and of whom only two died, cannot reasonably be believed to have been the subjects of extraordinarily severe injuries.

Dr. Swinburne reiterates at some length the doctrines which he has heretofore advanced as to the treatment of fractures, and particularly as to the treatment of fractured thigh by extension and counter-extension alone, without the aid of lateral support; he also goes out of his way (as it seems to us) to accuse Dr. Gurdon Buck of "a very delicate kind of professional plagiarism," in recommending the treatment by weight and pulley, of which, as is well known, Dr. Buck has been, for the last ten or twelve years, an enthusiastic advocate. We are not aware that Dr. Buck has ever claimed to be the originator of the employment of *extension and counter-extension* in the treatment of fractured thigh, nor (we must add) do we think that such a claim could be successfully maintained on behalf of Dr. Swinburne himself; on the other hand, while the use of the weight and pulley is, as our readers know,¹ at least as old as Guy de Chauliac, in the fourteenth century, the credit of reviving and popularizing the method—to such an extent that English writers describe it as the "American method"—is undoubtedly due to Dr. Buck more than to any other surgeon.

Dr. Johnston's essay has at least the merit of brevity; of his twenty-four patients he lost seven, and having little or nothing to say, he judiciously occupies but five pages in saying it.

In addition to the plates, ten in number, which appear at the end of the book, it is adorned with a frontispiece and sixty-one wood-cuts. Of those which illustrate the happy results of Dr. Swinburne's treatment, several represent patients entirely naked except for neatly fitting suspensory bandages which conceal those parts which, in civilized communities, are not ordinarily exhibited

¹ See Dr. Edward Hartshorne's papers in numbers of this Journal for April, 1869, p. 338, and July, 1869, p. 278.

to the public gaze; if the volume be meant for professional readers only, this is, we think, unnecessary—if it be designed as an ornament for the centre-table, we confess that, as a matter of taste, we should prefer the traditional fig leaf.

J. A., JR.

ART. XXVIII.—*Lessons on Laryngoscopy; including Rhinoscopy and the Diagnosis and Treatment of Diseases of the Throat.* By PROSSER JAMES, M.D., M.R.C.P., Lecturer on Mat. Med. and Therapeutics at the London Hospital, Physician to the Hospital for Diseases of the Throat, etc. 12mo. pp. 176. London: Baillière, Tindall & Cox, 1873.

THIS book has the merit of being concise and practical. The "lessons," as the author styles them, are well adapted to guide the novice in laryngoscopy. Rather an undue amount of space, however, is devoted to the historical details of the invention of the laryngoscope, and then that hackneyed account of the priority-strife is once more recited. In fact Mr. Prosser James advances some rather ambitious claims of his own as to originality in the use of reflected light in making topical laryngeal applications. It must be conceded, however, that he, if not the Nestor of laryngoscopy, has at least been one of the most indefatigable workers in this department ever since its first inception; and we must confess to no little disappointment, that, instead of giving his own views, matured by years of practical experience in the treatment of diseases of the throat, upon laryngeal pathology and the relative value of various therapeutic agents, he rather has seen fit to limit the scope of his book to the mere technics of laryngoscopy. We had imagined that medical literature was already amply studded with elementary treatises upon this topic, but no doubt the impartial and concise manner with which the author handles it, will secure him many readers, whatever other merits or demerits the book may possess. The student will recognize the value of the five excellent chromo-lithographic plates which embellish the text; he cannot fail to be instructed by the perusal of the reprint of Garcia's hitherto inaccessible "Observations on the Human Voice;" he will also no doubt be impressed with the absence of anything like order—Heaven's first law—in the arrangement of the fourteen chapters which comprise the book, more especially so, since there is neither an index or even as much as a table of contents appended. The omission of anything worthy of the designation of pathology may perhaps be considered as pardonable in a book of this kind, but that of an index certainly is not.

R. M. B.

ART. XXIX.—*Ligation of Arteries.* By Dr. L. H. FARABEUF, Aide d'Anatomie à la Faculté, etc. Translated by JOHN D. JACKSON, M.D., of Danville, Kentucky. With engravings. 12mo. pp. 157. Philadelphia: J. B. Lippincott & Co., 1874.

THE author announces in his preface that this little book is to form the first part of an operative manual in which he "will treat solely of the current urgent operations (amputations, ligations, etc.) which every practitioner is called upon to perform, and which, contrary to what is the case regarding special operations, are not much dwelt upon in the books on general surgery."

We might question the justice of this charge, as regards amputations at least, for these operations are, we think, certainly described with sufficient minuteness in most modern surgical text-books. With regard to ligations, on the other hand, how often, we may ask, is "every practitioner" actually called upon to take up the peroneal artery, or the subclavian, not to speak of those which the author calls exceptional operations, such as deligation of the innominate, or of the common iliac?

The truth is that the value of such manuals as Dr. Farabeuf's is not in teaching the student methods of treatment which he will with any probability have occasion to resort to in practice, but in furnishing him with a guide for such operations as he can conveniently perform in the dissecting-room, and the habit of performing which will impart to him a facility in manipulation which can afterwards be utilized in any surgical procedure he may be called upon to undertake.

Regarded in such a light, Dr. Farabeuf's book seems to us a very good one; the directions for performing the various operations are clear and sufficient, and the illustrations, upon the whole, better than those which are found in the chapters on ligations in most of our text-books. When, however, a surgeon, called upon to tie an artery in its continuity, finds it necessary to refresh his memory as to the anatomical relations of the vessel with which he is going to deal, he will, we think, do better to resort at once to the dissecting table, or, if this cannot be done, to a large work such as that of MacLise, rather than to any pocket-manual, excellent though this may be of its kind.

Dr. Jackson has done his work as translator in a satisfactory manner; if we were to offer any criticism upon this point, it would be that his version is unnecessarily literal.

The book is neatly, and, indeed, elegantly printed, and the illustrations, as we have already mentioned, more than ordinarily good; though the latter are numbered from one to forty-three, there are really but thirty-five, eight being made to do double duty in different parts of the volume. J. A., Jr.

ART. XXX.—*Skin Diseases; an Inquiry into their Parasitic Origin, and Connection with Eye Affections; also the Fungoid or Germ Theory of Cholera.* By JABEZ HOGG, Surgeon to the Royal Westminster Ophthalmic Hospital, etc. etc. 12mo. pp. 108. London: Ballière, Tindall & Cox, 1873.

THIS is truly a most extraordinary little work! When we consider that it was written in the year eighteen hundred and seventy-three, by one living in the heart of great London, surrounded by all the literature which the world offers, we cannot otherwise than wonder how it was possible for the author to stray so far away from truth and recognized fact. To say that he has seen with his microscope what no else has ever seen, or probably ever will see, gives but a faint idea of the many startling statements which meet the eye upon almost every page.

In turning over the first pages of the monograph we come upon a passage which causes us to pause and ask ourselves whether we know anything of the nature of cutaneous diseases; or has our author progressed with such rapid strides into pathology as to have left us, and the literature of yesterday, far, far back among the things that were! After a brief introduction, our author says: "The cases investigated were chiefly derived from fourteen genera of Willan's classification;

namely, Porrigo, Psoriasis, Pityriasis, Sycosis, Lepra, Lupus, Lichen, Impetigo, Furunculus, Eczema, Vitiligo, Spilus, Ichthyosis, and Acne. The spores or filaments of a cryptogamic plant were found in most of the genera." Now, without further remark, it is very evident that either the author possesses most remarkable powers of vision, and has made some valuable discoveries in pathology, or that he has fallen into a series of most egregious errors. Let us examine a few of his statements. After a vague and indefinite account of psoriasis, for the most part erroneous, we read: "In all, twenty cases of the various forms of psoriasis and lepra were examined; and in twelve of them spores and threads were found, mixed with epithelium and granular matters; but in no respect did the fungoid elements differ from those discovered and described as belonging to other dermatophytæ." A few lines further on we notice, "that psoriasis is not of local or parasitic origin, is proved by the failure of topical applications in its treatment." It must be admitted, we think, that the views entertained are by no means clear concerning the pathology of this disease! Eczema also receives microscopic study from our author, who states that "the hair is matted together by the discharge, and in four out of six cases examined, I observed the spores or mycelia of a fungus. In one, the spores were in masses or minute heaps; and in another, an epithelial cast, from which the hair had escaped, was surrounded by a filamentous growth that had probably encircled the hair." In ichthyosis there were "fungus threads binding the scales more intimately together, weaving them, as it were, into a consolidated mass." Lichen simplex, or eczema papulosum as we should prefer to call it, was found to contain its due proportion of "spores," they being "of a reddish-brown colour, invading the shafts of the hairs, similar indeed to the fungus found in mentagra." The pathology of lupus, which we did think was becoming quite comfortably settled, has likewise received a blow from our author, he having found in two out of eight cases investigated, "evidences of fungoid spores, mixed with epithelial scales, fat and pus-corpuscles, and dark-looking granular bodies." But we shall quote no more. The experiments are valueless, for no detail is given as to the manner in which the examinations were conducted. The "spores and threads" of psoriasis; the "spores and mycelia of a fungus" found in eczema; the "fungus threads" of ichthyosis; the "reddish-brown spores" of eczema papulosum; the "evidences of fungoid spores" discovered in lupus, etc. etc., afford but a very imperfect picture to the mind of the mycologist. Science demands more accuracy in its nomenclature, and a reference to the mycologies of Corda, Bonorden, Fresenius, Du Barry, and others, would have shown our author that it is customary, in the scientific world, to describe fungi in more definite terms. An extremely rough wood-cut ornaments one page, where these various hitherto undescribed vegetable growths are professed to be shown.

The book is written in a thoroughly unscientific manner, and in the hands of the general reader, for whom it was evidently written, it can only mislead, and be the means of disseminating theories which have not so much as their shadow to support them.

L. A. D.

ART. XXXI.—*Kin-Se I-Setzu.*

Modern Medical News. Edited by STUART ELDRIDGE, M.D. (U. S.). In charge of the Government Medical School, Hakodate. Nos. 1 and 2, for March and May, 1874. Yeddo, Japan.

WE are indebted to its able editor for the first two numbers of this periodical, which he informs us is the first medical journal ever published in Japan. It is a bi-monthly, is printed at the expense of the Imperial Government, and has already a circulation of one thousand copies. It is primarily intended, we are further informed, for a large class of native physicians, who have already become somewhat acquainted with western medical science, either by means of oral instruction or through the few existing translations of medical books, but who have no knowledge of any language but their own.

The following list of the articles contained in the second number, published in May last, will serve to afford our readers some idea of the character of the journal.

Art. 1. Lecture on Urethral Stricture, by the Editor; 2. Surgery without Hemorrhage (Esmarch's method); 3. Apparatus for Digital Dislocations; 4. Government Inspection of Coal Oil; 5. On the Relief of Pain; 6. Necessity for Education of Midwives in Japan; 7. Use of Salts of Copper in Cholera; 8. The Nitrite of Amyl, a New Remedy in Asthma; 9. Rules for the Administration of Arsenic; 10. Oxide of Zinc in Diarrhœa of Children; 11. Tinctura Ferri Chloridi in Smallpox; 12. Gelatine Suppositories in Fecal Accumulation; 13. Treatment of Syphilitic Onychia; 14. Tinctura Ferri Chloridi in Post-partum Hemorrhage; 15. Ergotine in Hemorrhage; 16. Glycerine as a Vehicle for Medicines, with Table of Solubilities; 17. New Sign of Death; 18. Worms in Heart; 19. Bloodvessels of the Dog in China and Japan.

The efforts now being made by the enlightened Government of Japan to diffuse useful knowledge among the people, and to extend to them the benefits of education, are worthy of the highest commendation, and cannot fail to produce rich fruits in the near future.

QUARTERLY SUMMARY

OF THE

IMPROVEMENTS AND DISCOVERIES

IN THE

MEDICAL SCIENCES.

ANATOMY AND PHYSIOLOGY.

1. *Transfusion with the Blood of Different Animals.*—Some very interesting and valuable experiments have lately been made by Professor LANDOIS, of Greifswald, to determine the changes which take place in the blood of one animal when transfused into the circulation of another of a different species. He was led to investigate the subject in consequence of the use which has lately been made of animals' blood in transfusions into the human subject.

Dogs were injected with the blood of man, of the sheep, cat, guinea-pig, calf, pig, and pigeon; rabbits, with the blood of the hare, sheep, calf, and of man; while transfusion of human blood was performed on the sheep. The frog was especially studied as the subject of transfusion of the blood of all the animals already enumerated, as well as of the pike, and the *Rana esculenta* was injected with the blood of *Rana temporaria*. The veins which run on the surface of the frog's abdomen render transfusion with an ordinary hypodermic syringe very easy of execution. It was found that if from 0.5 to 0.8 cubic centimetres of fresh or defibrinated mammalian blood were injected into the veins of a large frog, changes rapidly occurred in it, the most marked being a dissolution of the red corpuscles, so that the frog's serum acquired a deep ruby-red lac-colour (*Lackfarbe*), from the hæmoglobin set free from the corpuscles. In transfusions with rabbit's blood, the dissolution was nearly completed in from three to five minutes, and in other animals generally in from twenty to thirty minutes. Dog's and pigeon's blood resisted the longest.

The determination of these periods was made by taking separate portions of blood at very short intervals from one of the frog's toes, the blood being put up for microscopic examination in Pacini's fluid (corrosive sublimate one part, pure chloride of sodium two parts, glycerine thirteen parts, distilled water 113 parts). Some idea of the amount of dissolved hæmoglobin was obtained by comparing the tint of the frog's serum with portions of the mammal's blood experimented on, diluted with known quantities of water. Part of the hæmoglobin of the dissolved corpuscles is found in the urine of the frog in company with albumen. Frog's blood (either fresh or defibrinated) was also mixed with the blood of the other animals and examined microscopically, or else their blood was examined in frog's serum. It was then found that the red corpuscles, often after first assuming an irregular outline, and exhibiting lively molecular movements, become perfectly globular, and so appear smaller than before; they then become paler and paler, till at last only the "stroma" remains visible, and this at last also disappears. The "stromata" often aggregate into masses, and thus can give rise to embolism and consecutive inflammatory phe-

¹ The term "stroma" is given by Rollett to the blanched, pale, globular residue of the red corpuscle, after removal of the colouring matter.

nomena in the circulation. Possibly the paralysis of the hinder extremities, and the weakened action of the central nervous system, which Landois has not unfrequently seen follow the injection of mammalian blood into the frog, may be due to such embolisms. If a frog be injected with serum which has been freed as much as possible from corpuscles, its urine is found for several days after to contain albumen and blood; so that in all cases of transfusion it is probable that some of the cells of the receiving animal are destroyed as well as those of the giver. But this mutual action varies much in different species, for moderate injections of serum from man and the sheep caused albumen alone to appear in the frog's urine.

The experiments in which transfusion was performed between two different species of the *mammalia* gave two chief results: (a) The serum of the blood—either fresh or defibrinated—of many mammals dissolves the blood-corpuscles of other mammals, and of the former the dog's serum is most powerful, and the rabbit's the least. (b) Mammalian blood-cells vary much in their resisting power to the action of the serum of other animals, and here, again, the rabbit suffers most, and the dog and cat resist the longest; the dissolution is accelerated by warmth. Rabbit's blood injected into a dog is destroyed in a few minutes. The dissolved constituents of the blood are disposed of in two ways: they are partly excreted, principally by the urine, but in smaller and uncertain quantities by the bowels, uterus, bronchi, and into the serous cavities. The other part probably goes towards the nutrition of the receiver.

As to the value of transfusion as a remedy, either for loss of blood or for constitutional anæmic conditions, Dr. Landois believes that it may benefit the receiver in three ways—(1) by bringing nutritive material into his body; (2) by the oxygen which is derived from the dissolved blood-cells and in its serum; (3) by possibly, in certain circumstances, improving the mechanical conditions of the circulation. He does not think that there is much probability of the foreign blood-cells ever taking on themselves the physiological functions of those of their receiver—at any rate where the two species stand a little way apart in the scale of nature—but he has no data on which to found a certain opinion with regard to very closely allied species.

Albumen and hæmoglobin are found in some cases in the urine as early as one hour and three-quarters to two hours and a half after transfusion, and their excretion lasts twelve hours or more. In consequence of the partial destruction of the cells of the receiver's blood by the foreign serum in some animals (*e.g.*, the rabbit), symptoms of great severity and danger may occur, after the operation, such as immensely quickened respiration, dyspnœa, convulsions, and even death or asphyxia may follow it.

Portions of test blood, taken at different intervals from animals in such conditions, show all stages of dissolution of the corpuscles, and the urine becomes bloody and albuminous if life is sufficiently prolonged. In animals whose corpuscles have great resisting power (*e.g.*, the dog), these phenomena do not appear, the foreign serum itself undergoing change before it has time to act.

Death may occur, after copious transfusions, from the rapid massing together of the foreign (or the animal's own) blood-cells, which leads to extensive coagulations of fibrin in the vessels; and many kinds of blood exhibit the phenomenon that when mixed with other blood their corpuscles aggregate into masses, which may give rise to capillary embolisms in the lungs. The danger of transfusion into the blood of different animals, therefore, depends on the relation of the species employed.

As a sort of appendix to Dr. Landois's experiments, we should like to record here some cases of actual transfusion of *lamb's* blood into the human subject, published by Dr. Hasse, of Nordhausen (*Tagesblatt der 46 Versammlung, Deutscher Naturforscher*; Wiesbaden: No. 7, 1873). Interesting in themselves, they derive additional interest from the light which Dr. Landois's researches throw on some of their phenomena, and they afford an indirect confirmation of his statements of a striking nature. The cases are twelve in number, and distributed as follows: Five were phthisis, two chlorosis, two cachexia after severe illness, one cachexia with caries of the vertebræ, one carcinoma ventriculi, and one placenta prævia with severe hemorrhage. This

last case recovered rapidly, the two cases of general cachexia recovered gradually, and the chlorotic patients only very slowly. The patient with carcinoma was temporarily benefited, and the one with spinal disease improved in general health and had less suppuration. The results in the phthisical cases were wonderfully satisfactory (*enorm günstige*).

The reaction following the operation was very violent. There was marked dyspnoea, which even amounted nearly to apnoea, and necessitated interruption of the operation after sixty to ninety seconds. Half an hour afterwards there was a violent rigor, and the temperature rose to 40.9° C. (105.6° Fahr.), and then deep sleep followed, and on waking there was a feeling of comfort experienced. The patients quickly gained several pounds in weight, and their muscular strength and mental energy rapidly improved. In a few cases there was a slight excretion of albumen and the colouring matter of the blood in the urine. Does not Dr. Landois give the key to the dyspnoea and to the condition of urine here described?—*Med. Times and Gaz.*, May 30, 1874, from *Centralblatt*, Nos. 56 and 57, Dec. 1873.

2. *Electrical Stimulation of the Cerebral Convolutions*.—Recent investigations appear to have established beyond dispute the main facts of the experiments of Hitzig and Ferrier on the effects of electrical stimulation of the cerebral convolutions. But there is much less certainty about the interpretation of those facts. Are the convolutions, as Ferrier maintains, the actual motor centres for the movements obtained with such precision and uniformity, or is it that those regions of gray matter are in connection with lower motor centres, which may be set in action by the excitation of the higher? Considerable support is afforded to the latter view by some experiments which Dr. BURDON SANDERSON recently related to the Royal Society. Their object was to ascertain how far the definite movements resulting from the stimulation of certain points on the convolutions, which Dr. Sanderson proposes to designate by the neutral name of "active spots"—how far these precise movements can be produced, as Dupuy has asserted and Ferrier denied, by excitation of the subjacent white substance. He found that after removing the cortex of a cat's brain in the position of the active spots for certain definite co-ordinate movements, the section of the white substance yielded results on stimulation precisely similar to those afforded by the surface of the convolution. The same active spots could be found by stimulation of which the same movements were produced, and these spots had the same topographical relation to one another as those on the surface. Moreover, if the upper and outer part of the corpus striatum was exposed and tested, the same result was obtained. On it could be found the same active spots, in similar relation, which yield on stimulation the same movements, equally definite and precise. He concludes from these observations that the superficial convolutions do not contain organs which are essential to these combinations of muscular movements, and that it is probable that the doctrine is true which has hitherto been accepted by physiologists, that the centres for such movements are to be found in the masses of gray matter which lie in the floor and outer wall of each lateral ventricle. Similar experiments had, indeed, been made just before by Braun, of Giessen, whose account corroborates entirely Dr. Burdon Sanderson's independent results.—*Lancet*, June 27, 1874.

3. *Injury to the Brain with Pulmonary Hemorrhage*.—H. NOTHNAGEL finds on injuring with a needle a certain spot on the surface of the brain of the rabbit that peculiar disturbances occur, above all, hemorrhage in the lungs and in the tissue of the same, often so pronounced that almost the whole lung is traversed by the hemorrhage. Brown-Séquard, as is known, has also observed this, not however from injury to the surface of the brain, but of its basilar portion. Secondly, in the same way, meningitis can be regularly produced, chiefly bilateral, very seldom on the injured side, sometimes only on the half opposite to the injured side. This meningitis, the author thinks, is not a mere accidental circumstance.—*Journ. Anat. and Phys.*, May, 1874, from *Centralblatt*, No. 14, 1874.

4. *On Apnœa and its Influence on Convulsions.*—Dr. W. FILEHNE gives an experimental critique of a work by Brown-Sequard, in which that author made a number of rather extraordinary statements. It is well known that artificial respiration in animals produces by and bye the condition known as apnœa, in which the animal ceases to make any independent respiratory movements, leaving its respiration, as it were, entirely to the apparatus. It has generally been considered that the cause of this apnœa is the superoxygenation of the blood. The muscular movements of respiration are supposed to depend on the irritation of the respiratory centres, by blood containing an excess of carbonic acid or a deficiency of oxygen; and when by artificial respiration an excess of oxygen is supplied, then the respiratory efforts cease, because this irritation is withdrawn. On the other hand, a deficiency of oxygen not only irritates the respiratory centres unduly (violent respiratory efforts of dyspnœa), but also renders the various other motor centres unusually sensitive (convulsions of extreme dyspnœa). It takes, however, a high degree of this deficiency of oxygen to raise the excitability of the respiratory and motor centres sufficiently to produce convulsions. But strychnia is known to increase the excitability of these centres to such an extent, that even with ordinary respiration the slightest sensible impression is sufficient to set up the most violent reaction. If, however, we reduce the normal excitability of these centres by the superoxygenation present in apnœa, then it should require a much larger dose of strychnia to produce the effects referred to. It is well known that artificial respiration which is pushed, so as to produce apnœa, interferes with the convulsions of strychnia poisoning, and this fact has been taken as confirmatory of the views just stated. Brown-Sequard, however, in the paper referred to, opposes these views. It is true that artificial respiration interferes with the development of the convulsions of strychnia; but it does so not from the superoxygenation of the blood, but from the irritation of the air passages by the air which is forced in by the bellows. The ends of the vagus, phrenic, and other nerves are irritated, and this irritation interferes with the action of the strychnia. Irritation of these nerves by other means similarly reduces the action of strychnia—the irritation of a current of carbonic acid applied to the mucous membrane of the air-passages or pharynx. These observations of Brown-Sequard appeared of great importance, because by this form of irritation he claimed to be able to avert the convulsions not only of strychnia, but of epilepsy, by this simple means of a current of carbonic acid. The present author, therefore, thought it worth while to repeat Brown-Sequard's experiments, and he denies his results almost *in toto*. He finds that the introduction of a current of CO₂ does produce a temporary stoppage of the respiration, but this is a reflex phenomenon, and has no relation to apnœa. A current of CO₂, on the other hand, makes no difference in the convulsions of strychnified or epileptic animals. The author, therefore, recurs to the old view of the production of apnœa, and of the mode in which artificial respiration reduces the action of strychnia.—*Glasgow Med. Journ.*, July, 1874, from *Reichert and du Bois Reymond's Archiv*, Nos. 3 and 4, 1873.

5. *Cause of Death after Varnishing Animals.*—The cause of death after the skin of animals has been covered with varnish has been the subject of much discussion. It has been ascribed to asphyxia, reduction of temperature, retention of perspiration, etc. Dr. FEINBERG has repeated the experiments, and he considers that the symptoms are due to a general dilatation of the entire vessels of the body. He finds in all parts dilatation, over-filling, and often rupture of the bloodvessels. In the spinal cord there was congestion, extravasation of blood, and hyperplastic formation of the neuroglia around the extravasations. There were constantly extravasations in the mucous membrane of the stomach. There were often extravasations in the liver, etc. Such an universal relaxation of the bloodvessels throughout the body must be due to paralysis of the vaso-motor centres. This would produce immense reduction of the intravascular pressure, and sinking of the action of the heart with stasis in the capillaries. It is well known that the vaso-motor centres are subject to reflex action by irritation of sensory nerves; and it is here supposed that the intense irritation

of the cutaneous nerves by the varnishing may be sufficient to paralyze these centres. This would account for the phenomena. The nervous symptoms, such as hyperæsthesia, partial anæsthesia, reflex tetanic convulsions, partial paralysis, etc., are sufficiently accounted for by the congestion of the gray matter of the cord. Then the very marked reduction of temperature may be due to the increased radiation of heat in the hyperæmic cutaneous vessels. It is to be noted that the author's microscopic specimens were looked over, and his facts confirmed, by the distinguished histologist Frey.

6. *On the Alkalinity of Urine.*—V. FELTZ and E. RITER (*Journal de l'Anatomie*, February, 1874, p. 311) have conducted a series of observations on the human subject, and made experiments on dogs, upon this subject. They arrive at the following conclusions: 1. The urine is only very rarely ammoniacal except in affections of the genito-urinary apparatus. The occurrence of alkalescence in the great majority of cases is to be ascribed to defects in the vessels, or to the mixture of the urine with more or less altered albuminous substances. 2. Urine placed in contact with the ammoniacal ferment, whose activity has been tested by its action on a solution of pure urea, does not undergo the ammoniacal fermentation with such rapidity as might appear from its composition. 3. The urine of sound healthy animals exempt from vesical or renal affections, does not become ammoniacal by prolonged retention in the bladder, produced by different mechanical methods. 4. Catheters impregnated with the ferment are not sufficient to render the urine of healthy animals ammoniacal. 5. The urine becomes ammoniacal temporarily, when a catheter, impregnated with the ferment, is allowed to remain in the bladder. 6. The same effect is produced on introducing into the bladder a solution of the ferment, and retaining it by mechanical means for about twelve hours. 7. Uræmia cannot be ascribed either to the retention of urine, or to the carbonate of ammonia produced by the decomposition of urea; for the former of these two substances is innocuous, and the second does not produce convulsions, unless in concentrated doses, the production of which in the blood is difficult to admit. 8. The decomposition of urea into carbonate of ammonia only takes place under the influence of a ferment or chemical agents which we have not taken into account here. This decomposition does not appear to take place in the blood, for injections of urea and the ferment did not produce uræmia. 9. The chloride, sulphate, phosphate, tartrate, benzoate, and hippurate of ammonia, when injected in sufficiently concentrated solutions into the blood, produce, from a physiological point of view, effects similar to those of carbonate of ammonia. 10. These salts are rapidly eliminated by the urine and saliva; the tartrate and benzoate do not undergo their usual transformation. The urine never becomes ammoniacal; and the breath is free from ammonia. 11. These salts, though of such a strength in solution as not to dissolve the red blood-corpuscles, nevertheless modify the properties of the latter. This fact is demonstrated by examination with the microscope, and by analysis of the gases contained in the blood; the absorptive capacity of the red blood-corpuscles for oxygen is notably diminished; while, on the contrary, the resistance to the action of water and acetic acid is increased.—*London Med. Record*, June 10, 1874.

MATERIA MEDICA, GENERAL THERAPEUTICS, AND PHARMACY.

7. *Experiments on the Elimination of Alcohol from the Body.*—Dr. ANSTIE gives (*The Practitioner*, July, 1874) the results of experiments made by himself and Dr. Dupré to decide, if possible, the question whether alcohol to any appreciable extent escapes *unchanged* from the body of an animal which has digested it. With that view he examined the different secretions, etc., which might be channels of the elimination of alcohol.

1. As regards the kidneys, the experiments prove that they do not, practically speaking, eliminate any alcohol at all.

2. As regards the skin, the experiments prove that no considerable quantity of alcohol escaped in that way. It is only in the profound narcosis of dead-drunkness that the skin gives off any quantity of alcohol that can be readily discovered by tests.

3. By the feces: The alcohol in the feces of a typhus patient whose daily allowance of brandy (in health he was almost a teetotaller) was six ounces, proved to be less than $\frac{1}{10}$ th of a grain in 24 hours, according to the experiments of Dr. Dupré.

4. The lungs: Dr. Dupré's experiments, made during twelve days, show that about $3\frac{1}{2}$ grains only of alcohol were eliminated during the period in the breath, of nineteen ounces swallowed.

Dr. Anstie considers that the subject of the elimination of unchanged alcohol may now be considered as closed, and that we can see our way to the discussion of other very important questions respecting the physiological rôle of alcohol. Dr. Parkes intimates that in the event of alcohol having *proved* to be destroyed in the body, it would be especially necessary, before coming to any decision as to its physiological value, to make out clearly the nature of its influence upon the elimination of carbon from the body. That task Dr. Anstie and Dupré are now engaged in.

"It is impossible," says Dr. A., "fully to appreciate the importance of the further inquiries which must be made respecting the action of alcohol unless we remember the actual state of physiological knowledge respecting the processes of alimentation. No physiologist of any standing at present doubts that hydrocarbons and hydrates of carbon by their consumption produce available force within the body, and, in fact, that the bulk of the work done in the organism is obtained from these substances. Alcohol, as Dr. Pavy remarks, stands in a peculiar position, being intermediate, as to composition, between these two classes of foods. Being, as it is, a most highly oxidizable substance, it would be strange indeed if its oxidation did not prove to be the mode by which alcohol disappears within the organism. And looking to the fact that Dr. Parkes and myself have from independent (and indeed opposite quarters) come to singularly close agreement as to the daily allowance of alcohol that can be taken without producing any narcotism or other visible disturbance in the organism, I think I may take it as conceded that quite 600 grains of absolute alcohol can be disposed of daily within the organism of an adult male without any perceptible injurious effect upon the bodily functions. Now, this quantity of alcohol is (theoretically) capable of generating an enormous amount of force; but it is equally certain that that force does not show itself under the form of heat. It is scarcely possible, therefore, but that the solution of the questions as to the action of alcohol in the body will also bring about the discovery of new physiological facts of great interest and importance:—

"1. If alcohol be a force-producing food, as seems by far the most likely, it is probably of great value in that capacity, on account of the rapidity with which its transformations take place. It is, however, abundantly certain that beyond a certain dosage (which is pretty clearly made out for the average, though of course there are individual exceptions in both directions) it becomes a narcotic poison of a very dangerous character in every respect, not the least disadvantage being that it cannot be eliminated to any considerable extent.

"2. If alcohol does not disappear by oxidation, it must undergo some as yet quite unknown transformation, after which it must escape unrecognized in the excretions. I have heard various attempts to suggest such modes of disappearance, but nothing, so far, which wears any air of probability.

"3. If alcohol, however, be indeed oxidized, and yet does not beget force which can be used in the organism, this would be the strangest possible discovery. Considering the very high theoretical force value of the 600 to 800 grains of absolute alcohol which millions of sober persons are taking every day, we may well be hopeless of any reasonable answer to the question—Why does not this large development of wholly useless force within the body produce some violent symptoms of disturbance?"

8. *Action of Chloral on the Blood.*—In a communication to the Paris Academy Drs. FELTZ and RITTER enumerate the following conclusions from experiments on this subject:—

1. A solution of chloral (titrated to a fifth) injected into a dog's veins, causes the death of the animal, if the dose exceed 0.25 gramme per kilogramme. The temperature falls some tenths of a degree, seldom one degree. The respiration, momentarily accelerated, is soon retarded, becomes tetaniform, and stops; and along with these phenomena may be observed a trembling of the respiratory muscles, great paleness of the mucous membrane, some convulsions of the ocular globe, and great dilatation of the pupil. The heart-beats increase in frequency, become irregular, and cease an instant after the respiration. Conscious sensibility disappears before reflex sensibility; the latter is followed by muscular atony. There is no lesion found in the blood or in the viscera; death appears to be due to the action of the chloral on the nervous centre which governs the respiration.

2. The effects produced are different when one injects into the animal only the dose of chloral necessary to anæsthesia, and maintains it in this state by successive injections of fresh quantities whenever the reflex sensibility appears to return. Death occurs after twenty-four hours or thirty hours at the most. The dose of chloral necessary to maintain anæsthesia continuously diminishes, and the interval of the injections is more and more extended; four or five hours before death all injection becomes useless. The number of inspirations and expirations diminishes slowly and progressively, and is at length reduced to five or six in the minute. The heart-beats are accelerated as the respiration diminishes; the pulse, small, weak, and thready, ceases to be perceived, while the noises of the heart still persist. The arterial tension, indicated by the hæmodynamometer, falls.

The temperature falls only one to six degrees (Cent.) during the first six hours; it rises again rapidly from this point. We have seen it reach seventeen degrees; nearly always death takes place between twenty-four and twenty-eight degrees.

The saliva flows abundantly during the first hours; it becomes exhausted from the time when the temperature and the tension are notably lowered. Urine and dung are excreted from time to time.

The urine contains hæmoglobin in solution, easily recognizable with the spectroscope. The search for colouring matters of the bile, by the most delicate methods, has always led to a negative result. In two cases we have found glucose, which reduced Barreswil's liquor, was rendered brown by potash, and fermented alcoholically with beer-yeast. The urine always remained acid. The red colour of the urine frequently coincides with ecchymotic spots in the digestive mucus. The lungs, the liver, and the kidneys, always hyperæmic, never presented infarctus.

The alterations of the blood are profound; the corpuscles, deformed, have lost their elasticity; the plasma presents a red colour, which increases more and more. The field of the microscope is rapidly covered with crystals of hæmoglobin. We may state that we have never observed the like after section of the pneumogastrics, though this operation brings on some phenomena similar to those which we have observed during chloralization. The alteration of the blood is further shown from analyses of gases of the blood made at different periods of the chloralization, and by the capacity of absorption of this liquid for oxygen with which it is agitated. Without insisting on these various points, we content ourselves with saying here that the arterial blood of a dog, shaken with oxygen, takes up 250 cubic centimetres per 1000 before chloralization, and only 175 before death.

3. The toxic action of chloral is sometimes manifested after the waking of the animal, when the chloralization has been prolonged for a dozen hours, and the temperature has fallen to 30° Cent. (86° Fahr.). The alterations of the blood and the urine are then the same as we have described.

The waking of the animal is more rapid, the less the temperature and pressure have been lowered. Reflex and conscious sensibility appear in the first place; it takes two or three hours for the ataxic movements to be regularized.

We have found, in studying the products of respiration, that the greater part of the chloral is exhaled without being transformed. The product of condensation, a little milky, had not the least odour of chloroform, but it reduced, in heat, an ammoniacal solution of nitrate of silver. This character is common to chloral and to chloroform; but a solution of this latter substance which should produce a reduction to the same degree as our liquid of condensation would have a manifest smell and taste of chloroform. The condensed product further renders green a mixture of bichromate of potassium and sulphuric acid; this character does not belong to chloroform but to chloral. We have been able to assure ourselves, also, of the presence of another organic substance, but the small quantity we have hitherto succeeded in isolating does not allow analysis.—*London Medical Record*, Aug. 26, from *Comptes Rendus*, Aug. 3, 1874.

9. *Physiological Action of Chloral and Bromal Hydrates and Iodoform*.—Dr. MCKENDRICK read a paper on this subject before the Medico-Chirurgical Society of Edinburgh (June 3, 1874). After referring to the researches of Rabuteau, Steinauer, and Dougall, he gave the results of his own experiments, which were made with the view of ascertaining the precise physiological action of bromal hydrate. He showed: 1. That the action was first on the cerebral hemispheres, afterwards on the ganglia at the base of the brain, and, finally, on the spinal cord; 2. That the extreme contraction of the pupil was the combined effect of paralysis of the sympathetic and irritation of the third cranial nerve; 3. That the action on the heart was caused, first, by irritation; and, secondly, by paralysis of the sympathetic; the substance also acted on the intrinsic ganglia of the heart; 4. That the action on the bloodvessels, causing dilatation, was the result of paralysis of the sympathetic; 5. That the action on the salivary glands, causing very profuse secretion, was the result partly of paralysis of the sympathetic, and chiefly by irritation of the vaso-inhibitory and secretory filaments in such nerves as the chorda tympani. He then compared the action of chloral with bromal, and finally described the result of a few experiments made with iodoform, which he employed in place of iodal, a compound he could not obtain, and the existence of which is doubted by many chemists. Into the question of the chemical changes ensuing in chloral and bromal hydrates while in the blood, Dr. McKendrick did not at present enter. He also showed that atropia arrests the excessive secretion of saliva, by paralyzing (as Heidenhain has shown) the chorda tympani. The President (Dr. R. Haldane), in thanking the author for his paper, remarked that its physiological interest was only equalled by its probable therapeutical value. A new era in the treatment of disease was dawning, as we were learning that the first stages of many diseases were really affections of the nervous system acting on the vessels, which conditions such experimental researches may enable us to treat.—*Brit. Med. Journ.*, June 27, 1874.

10. *Injection of Chloral into the Veins*.—M. VULPIAN, in a communication made to the Acad. of Med. (June 2d), states that he has very frequently resorted to intra-venous injection of chloral as a means of producing anæsthesia in animals so as to facilitate vivisections; and that very often in dogs hematuria resulted and there was found very great renal congestion manifested by redness and ecchymoses in the substance of the kidneys.

He suspects the same effect might be induced in the human species, thus giving rise to lesions of the kidneys which might become permanent and perhaps result in Bright's disease. This consideration, he thinks, might induce surgeons to employ chloral as recommended by M. Oré.—*Archives G n rale*, July, 1874.

11. *The Diuretic Action of Digitalis*.—Dr. BRUNTON and Mr. HENRY POWER bring forward (*Centralblatt*, July 4, 1874) reasons founded on some recent experiments of theirs for rejecting the prevalent theory that digitalis increases the flow of urine by raising the blood-pressure in the arterial system. They injected digitalin in considerable doses into the veins of the dog, and drew off its

urine by means of a catheter. The injection was followed by great diminution or even total suppression of the flow of urine, while the blood-pressure rose simultaneously. After a time the latter again diminished, with, in some experiments, an immediate increase in the secretion of urine; whereas in others this did not occur until the blood-pressure had fallen below its normal state. In some experiments the rate at which the urine was secreted with a subnormal arterial tension was very considerable. Now, if digitalis owed its diuretic action simply to its power of increasing the blood-pressure, the secretion of urine ought to be considerably increased immediately after the injection, and to diminish *pari passu* with the blood-pressure. The experimental result is, however, exactly the opposite. The authors are therefore inclined to explain the diuretic action of digitalis by assuming that it stimulates the vaso-motor nervous system generally, while it exercises a special action on the vaso-motor nerves of the kidney. From this results a moderate contraction of the vessels of the whole body, with consequent increase of the blood-pressure; while in the kidney the contraction is excessive, and so puts an end to the flow of urine. As soon, however, as the stimulus to the vaso-motor nervous system is removed, the vessels of the kidney relax more quickly and more completely than the systemic vessels, so that the tension of the blood in the glomeruli of the kidney is still above the normal, although that in the general circulation is below it. This theory is further supported by the fact that albumen appears in the urine after the re-establishment of the secretion—just as Hermann has observed it to occur after mechanical obstruction of the circulation in the renal arteries. The authors consider that the action of digitalis may also be due in part to its direct effect on the secreting cells of the kidney, and they are at present investigating this point.—*Med. Times and Gaz.*, Aug. 1, 1874.

12. *Therapeutical Action of Quinia.*—M. SÉE has been delivering at the Charité a series of clinical lectures on the therapeutical action of quinia, some notes of which may be of interest. He is one of the most advanced scientific therapeutists, and believes that the action of drugs in disease may be predicted and explained by their physiological action in health. It is impossible to give more than a general idea of the views advanced and ably expounded by references to the natural history of the various diseases and the known action of quinia in their different forms, especially with regard to malarial fevers and acute rheumatism. His general conclusions are as follows:—

In health quinia has a threefold action: firstly, it diminishes the frequency and force of the action of the heart; secondly, it lowers the tension in the arterial system; and, thirdly, it lowers the temperature, or prevents its elevation by exercise, etc. Whilst recognizing its action on the amœboid movements of the white blood-corpuscles, as shown by Cohnheim, Binz, and others, he does not regard this as of great importance.

In an able analysis of the various forms of malarial fever, and the teachings of experience as to the value of quinia in each, he concludes that the drug cannot be regarded as a specific or counter-poison—as (1) it does not prevent malarial poisoning when taken as a prophylactic; (2) it does not prevent recurrence after a variable period; and (3) it is useless in some of the most fatal forms, especially where the fever tends to assume a continued type. Moreover, he points out that in other fevers which present the characters of periodicity and the occurrence of initial rigor—*e. g.*, urethral fever from catheterism—quinia has an equally beneficial effect. He believes that the effect of quinia in ague is due to its threefold action, exerted chiefly during the period of rigor: by its action on the heart, it diminishes its frequency and force; on the peripheral arteries, it lowers their tension and produces dilatation; on the spinal cord and vaso-motor centres, acting as a sedative, it tends to diminish their excitability; and, lastly, it exerts a direct cooling action on the system generally; the latter, however, being the least important factor.

In acute rheumatism, M. Sée considers it by far the most valuable medicine; and states that he always returns to it with benefit after the trial of all other methods of treatment. Here, again, he sees in its physiological action the most precise indications for its use. Especially in its effect on the spinal cord

—in lowering its irritability, and thus diminishing the sensibility to pain; and lessening reflex excitability, and thus reducing irritation and the afflux of blood to the inflamed joints—does he consider that its value lies. its action on the vascular system and in lowering temperature being also beneficial. The dose which M. Sée recommends is from $\frac{1}{2}$ to $1\frac{1}{2}$ grammes (or 8 to 24 grains nearly) in the day; increasing it, however, to 2 or 3 grammes, or even more if needful. It may be mentioned that this mode of treatment is adopted by a large number of the leading physicians in Paris, either exclusively or with other means; and they all appear to be unanimous in its favour. It is only in the acute stages that M. Sée considers it beneficial, except for the relief of pain, and in this respect it is also useful in gout.—*Lancet*, August 8, 1874.

13. *Therapeutic Value of Ipecacuanha administered as an Injection.*—M. H. CHOUPE states that in 1873 Dr. Bourdon first used the decoction of the root of ipecacuanha as an injection per anum in two infants attacked with severe diarrhœa; the results were most satisfactory. M. Choupe was hence induced to try it in the diarrhœa of tuberculous patients, and met with equal success. The preparation and dose he has found best are as follows: Twenty grammes of bruised ipecacuanha root are boiled in 500 grammes of water divided into three parts, each portion being boiled on the root for ten minutes. The three decoctions are mixed together and boiled down to 240 grammes, to which are added about ten or twelve drops of laudanum. This is enough for two injections. For infants the dose is proportionately less, and no laudanum is added. Two injections are administered per diem to the patient, the first being given between 7 and 8 A. M., that is to say, two hours before food, the second about 8 P. M., that is to say about three hours after the last meal. Vomiting was never observed. M. Choupe found that injection of decoction of ipecacuanha into the veins of an animal produced violent vomiting and remarkable *dryness* of the mucous membrane of the intestine. The chief substances taken up by water boiled on the root are emetine and tannin; and both appear to have a powerful influence in checking irritation. The conclusions he arrives at from the review of a number of cases of diarrhœa thus treated are: 1. That ipecacuanha, administered in the form of injection, produces very satisfactory results in the diarrhœa of tuberculous patients and in the choleric diarrhœa of young children. 2. By this proceeding the disorders of the stomach frequently caused by ipecacuanha are avoided. 3. Injections per anum can be continued for a long time without producing any trouble of the digestive function, nor weakening of the patient. 4. Ipecacuanha under these circumstances seems to act by absorption.—*Practitioner*, July, 1874, from *Bull. Gén. de Thérap.*, June, 1874, also in *Le Progrès Médical*, June, 1874.

14. *On the Action of Bromide of Potassium.*—In a note on an article by Professor BINZ, of Bonn, on the therapeutic use of bromide of potassium, in which the potassium is regarded as the true depressor of the muscular and nervous systems, and the bromine as inert, Professor TOMMASI makes the following remarks (*Il Morgagni*, January 1, 1874, and *Giornale della reale Accademia di Medicina di Torino*, June 10): "After many experiments in the use of the bromide of potassium, I believe I may express its action as follows: It has a positive action (1) in acute delirium, febrile or non-febrile; (2) in the eclamptic, epileptic, and epileptoid states; (3) in headache, but in a much less degree.

"On the other hand, I have found it completely useless in cases of insanity (*alienazioni mentali*); in the peripheric forms of nervous disease; in spinal irritation; in angina pectoris; and in asthma.

"It certainly has some hypnotic action, but does not approach chloral. In acute delirium I have given as much as eight grammes (two drachms) daily, and in epilepsy twelve grammes (three drachms), always with advantage, in the sense of diminishing the violence of the paroxysms. I know one case of epilepsy which may perhaps be said to be cured. On the other hand, I have given the bromide in large doses in cases of alternating convulsions without observing any effect to be produced.

"I have often used it in spermatorrhœa and priapism and in the irritative stage of spinal disease.

"I place but little credit in Binz's opinion, that all the effects are to be attributed to the potassium; I believe that in the cases referred to the medicine did good as bromide."—*London Med. Record*, July 15, 1874.

15. *Physiological and Therapeutical Researches on the Monobromide of Camphor*.—The *Practitioner* for August last, and also *Le Progrès Médical* for June 20th, contain a very interesting report by Dr. BOURNEVILLE, of Paris, of his experimental researches respecting the properties of monobromide of camphor. From his experiments, amounting to about forty, he considers himself entitled to attribute to mono-bromide of camphor powerful sedative properties, and to draw the following deductions:—

1. *Monobromide of camphor diminishes the number of beatings of the heart, and determines contraction of the bloodvessels of the ears and eyelids.* 2. *It diminishes the number of inspirations.* 3. *It lowers temperature in a regular and constant manner.* In fatal cases the lowering increases to the end. In those which recover, the lowering is followed by an elevation of temperature, which returns to its initial figure, but in a longer time than that during which the lowering was effected. 4. *Monobromide of camphor possesses undeniable hypnotic properties. It seems to act principally on the cerebral nervous system.* 5. *It does not seem that the medicament is got accustomed to; and its protracted use determines rather rapid loss of flesh in cats and guinea-pigs.*

16. *Apomorphia as an Expectorant*.—Dr. JURASZ, assistant at the Medical Dispensary at Heidelberg, has found apomorphia in the shape of the hydrochlorate, and administered in doses of one to three milligrammes every two hours, a valuable expectorant in cases of tracheitis and in bronchitis in its various forms. By its use the expectoration is rendered easier and more abundant, to the great relief of the patients, while the physical signs show a corresponding change from dry whistling rhonchus to plentiful moist râles, which gradually disappear. Dr. Jurasz adds a few drops of hydrochloric acid to the mixture in which the apomorphia is dissolved, to prevent the formation of the greenish tint which otherwise occurs, and which deepens the longer the solution is kept. The only ill effect which patients have complained of from the drug is slight nausea after the first dose, but this has disappeared after a second dose.—*Med. Times and Gaz.*, Aug. 1, 1874.

17. *Subcutaneous Injection of Hydrochlorate of Morphia*.—M. CHOUPE, who has performed many subcutaneous injections with the hydrochlorate of morphia, asserts that they act more promptly the nearer they are made to the seat of pain. Further, he says they are less painful than an injection of distilled water, and produce neither œdema nor any other local irritation.—*Tribune Médicale*, July 12, 1874.

18. *Valerianate of Amyl*.—Dr. W. F. WADE, of Birmingham, states (*Brit. Med. Journ.*, June 6, 1874) that "a spirit of the valerianate of amyl, to which a few drops of acetate of amyl (known in commerce as essence of Jargonelle pear) have been added, is, without any qualification or exception, not only the most elegant known preparation of valerianic acid, but intrinsically an agreeable drug. All these spirits improve in odour by a little keeping. I find that, to some stomachs, ethers are repugnant, unless well diluted; and six or eight drops of the compound spirit are, generally speaking, sufficient for an ounce of water, and also an adequate dose."

Dr. W. terms this "sp. amyl. valer. co." It consists of one part of ether to nineteen of spirit. To two ounces of this are added twenty minims of a spirit of acetate of amyl made in the proportion of one in twenty.

MEDICAL PATHOLOGY AND THERAPEUTICS, AND PRACTICAL MEDICINE.

19. *Aphasia*.—From an instructive paper on aphasia, in the *Revue des Deux Mondes*, M. CH. RICHET, we take the following remarks.

It is probable that, between the organ of thought and the vocal organ, there is a third, the organ of speech (*parole*); it is the lesion of this which constitutes aphasia. Certain authors, however, have held that aphasia does not exist; that the case is sometimes that of a loss of memory, sometimes that of destruction of the intellect. It is fitting that we should examine these two objections (though the problems relate rather to psychology than to physiology).

In the memorable discussion which took place in the Academy of Medicine, M. Piorry affirmed that aphasia was merely *verbal amnesia*; and so it was useless to make the faculty of language something special. It appears, however, that memory itself is not a faculty which can be distinctly defined. One cannot conceive a thinking being who has no memory; it is the basis of all our actions, and above all, of our ideas; whenever the mind thinks it makes use of anterior thoughts, and cannot separate itself from them. We identify ourselves, so to speak, with the notions we have acquired, and to separate the memory from the intellect can only be an analytic process, excellent for study, but impossible to accomplish in reality. It might be said, then, that there are different memories, applying to all the objects that we know, but that there is not a single memory. We see, indeed, that nothing is more capricious than memory. It is a common fact that each individual, according to his aptitude, retains certain things much more easily than others. One can recall verse, who is unable to retain prose; another will have the memory of figures, another, that of places; and yet we should not make, for figures, places, verse, or prose, a special faculty. It is quite otherwise with language, and if language be a memory, it is a memory so special, and has reached such a development in the life of individuals and the history of humanity, that it does not seem legitimate to confound it with other memories. For the rest, we find, from a study of aphasia, that it is produced specially; the aphasic play at chess and at cards, are interested in their affairs, understand them, discuss them, after their own manner, by multiplied forms of gesture, and a mimic language which they vary extensively. It is of little consequence if you call aphasia verbal amnesia; it would be sufficient to recognize that the verbal memory is a particular faculty, capable of being injured while the other faculties remain intact. But we will not even make this concession to the opinion of M. Piorry. Do we not see that the aphasic person who incessantly repeats *cousin*, and cannot say either *cou* or *sisi* separately, has lost something else than memory? The aphasic woman who said "*Bonjour monsieur*," every second, could never say "*Monsieur bonjour*"; yet she retained the memory of the two words.

It is not necessary, indeed, to believe that all the faculties of the intellect are continually submitted to the will. There is a certain amount of *automatism*, more or less similar to what the physiologists of our age have called *reflex action*. We may, from the theoretical point of view, consider the nervous system as constituted of a sensitive cell, into which enters a sensitive nerve, and which is connected with a motor cell, whence issues a motor nerve. When the sensitive nerve is excited, by pinching or the like, the excitation is transmitted to the motor cell which makes a muscle contract, by means of the motor nerve. In this case will, intelligence, consciousness have no part in the production of the motion; it is a fatal, an unreflecting action. . . . It is by reflex action that all those automatic and involuntary actions can be produced, that form three-fourths of human life. Thus when we take a walk we may think of anything else. Our intellect is not distracted by the movements we make, nor occupied with willing to walk. We are in this respect veritable automata: the step we take provokes a second step, and reflection does not act. M. Onimus has rightly compared language to the automatic functions of walking, of dancing, of playing on instruments. Certain observations of aphasia are very

interesting from this point of view. A patient to whom some one had said "How does that do?" replied, "It does very well." A few seconds afterwards he could not repeat this phrase. In such cases the patients speak quickly, as if they were afraid of forgetting.

From these examples we see that there are in language various elements; the memory of words, the arrangement of phrases, and that automatic part which permits of our speaking without effort. There is a fourth element which has considerable importance; I mean the intellect. It is impossible to regard aphasia as a total disturbance of the intellect; that is not destroyed when the faculty of language is abolished. A musician, having become aphasic, may write the notes of an air which he has heard sung. It is true, he may not be able to write a single syllable, yet he will write the music as if he were quite without disease. Can any maintain that the intellect of the man is destroyed?

Still, it must be admitted that the intellect, in the aphasic, is often gravely affected. Professor Rostan could no longer comprehend the *Entretiens littéraires* of Lamartine, and Lordat suffered all his life from the lesion of his intellectual region. From having been an orator and improvisator of the first order, he became, after his temporary aphasia, incapable of speaking in public. He read his lectures, and could no longer improvise. Nearly all the aphasic are weak-minded; they have ideas more or less infantile; the merest trifles make them laugh or cry. Material concerns, their meals, and their sleep, interest them before anything.—*London Med. Record*, Aug. 5, 1874.

20. *Pulsation of the Subclavian as a Sign of Superior Dilatation of the Aorta*.—Dr. A. FAUVRE writes (*Archives Générales*) that, contrary to what is observed under normal conditions, there may be noticed in certain cardiac affections peculiar pulsations in the carotid region, and at the base of the neck. That these pulsations originate in the passage of the blood-current through a large artery—the subclavian—may be shown in two ways: first, by placing the finger back of and below the tubercle of the scalenus anticus muscle, when this artery will not be found in its usual position; then by making compression over the seat of pulsation, when the pulse at the wrist is affected. If, on making this compression over the misplaced subclavian, the arterial walls be lightly impressed by the finger, a double vibratory tremor may be remarked. The first and most intense part of this is systolic, and is evidently produced by the rapid centrifugal passage of the blood-current. The second, of variable intensity, is caused by the return of the blood towards the heart; it is sometimes wanting.

Auscultation over the seat of pulsation demonstrates the existence of a double blowing murmur, evidently connected with the vibratory tremor above mentioned. The second part of this murmur is wanting when the second part of the tremor is absent.

In a number of necropsies of such cases, the existence of aneurism affecting the superior wall of the aorta has been ascertained. In these cases the subclavian is found displaced, and overlapping to a certain degree the omo-hyoid muscle. It is at first uncovered behind the clavicle, and then becomes more superficial. Finally, it is sinuous—that is, too long for its channel.

The double tremor and murmur appear to be independent of any abnormal condition of the aortic orifice. The fact appears to be that the walls of the dilatation, true or aneurismal, having lost their elasticity, allow themselves to become distended under the influence of the ventricular wave at the same time as the arterial system. But, owing to the impulsive force of the heart having been exhausted by the inertia of these walls, the arterial tension is lessened.

The diastolic reflux of a part of the contained blood results of necessity from this unequal subdivision of the blood-tension. It is the centripetal reflux which determines the diastolic murmur. The displacement of the subclavian is evidently due to elevation of the superior wall of the aorta. It is shown in the shortening of the course of the carotid and other vessels given off, causing them to become sinuous, and thus to give rise to the pulsations noted. If the aortic dilatation be equal over all parts whence the great vessels are given off,

the various phenomena alluded to will be observed equally on both sides of the neck. If, on the contrary, it be greater near the aortic origin, or on the other extreme of the arch, pulsation, etc., will only be observed on the affected side.

We have here, then, a valuable aid in the diagnosis and prognosis of superior aortic aneurism. For not only may the extent and position of the enlargement be ascertained approximately, but, if in the progress of the case the vibration and murmur should disappear, we may hope that the aneurismal pouch is being filled with clots.—*London Med. Record*, June 10, 1874.

21. *Aneurisms developed upon Branches of the Pulmonary Artery bordering upon Caverns.*—In the *Progrès Médical* there is an interesting paper on this subject. The branches of the pulmonary artery which ramify in the walls of caverns in phthisical subjects are most frequently obliterated. This is a point upon which all authors since the time of Laennec insist, and upon which the researches of Nat. Guillot have more particularly thrown light. In some cases, however, these vessels remain permeable, but undergo in a localized point a histological modification, as a consequence of which they become dilated, and there can then be found a small aneurism projecting into the cavern.

These cases are relatively rare, but many facts recently presented to the Anatomical Society lead us to think that by more rigorous search they would more frequently be discovered. In all the cases where it has been studied, the process appears to have been the same; it can be summed up thus: denudation of the vessel over a limited point, endarteritis in the embryonic transformation of the wall at this level; then simple dilatation or aneurism; lastly, most frequently rupture of this aneurism. The vessels injured by this alteration are not the capillaries; their calibre has varied from a half to three millimètres. They were generally parallel to the cavern; in M. Lepine's case the artery was perpendicular. The hæmoptysis following the rupture has generally been very abundant, and has almost always been followed by rapid death; in some cases, however, the hemorrhage has ceased and the patients have not immediately succumbed, and it has been possible to find at a later period the orifice obliterated by clots of blood of different ages. Occasionally there appears to have been at several times successive ruptures and obliterations. According to Powell these aneurisms are developed especially in cases of torpid (quiescent) phthisis, where they exist on one side only of old caverns; and, on the contrary, the hemorrhage from simple erosion of the vessel will be rather the result of the active process of rapid phthisis.

Again, in the two cases, this change in the vessel would not be in any wise possible unless it were by one single point in its surface adherent to the diseased pulmonary tissue, the chances of obliteration being, on the contrary, much greater if the entire vessel dip into the morbid product.

An examination of the observations shows indeed, that in the majority of cases the pulmonary tissue over the wall of the vessel opposite the aneurism is almost healthy; but as to the first point, if there are many facts in favour of the phthisis being evidently chronic, there are others absolutely contradictory.

The rupture of these aneurisms is not forced, and although they have seldom been detected except after profuse hæmoptysis, it has been possible to discover those which had not burst. But if we expect that in the cases of extensive pulmonary alterations, the field of distribution of the pulmonary artery is more or less contracted, and that, as a consequence, the vascular tension ought to be there increased, if we add to that the feebleness of the wall of the vessels, we cannot be surprised that this rupture should be the most ordinary result. According to Jaccoud, it will also be more frequent or more early, if there does not generally exist in these cases a dilatation of the right auriculo-ventricular orifice, the result of which ought to be to diminish the volume of the sanguineous shower.

As for the occasional causes of the rupture they are unknown; however, it has appeared in some cases that the hæmoptysis has been preceded by a violent

fit of coughing, but we ought always to ask ourselves if the fit of coughing was not itself the first symptom of the hemorrhage.

It is very evident, again, that these cases cannot be foreseen, and up to this time they have never been diagnosed before the rupture; but if we observe at an advanced period of phthisis a profuse hæmoptysis to come on suddenly, we should consider it due to the rupture of an aneurism, and we ought not on that account to neglect to treat the patient; it will, quite on the contrary, be more formally indicated, to seek to arrest at once the hemorrhage, since we know that in certain cases the aneurism has been able to be obliterated by a clot of blood.—*London Medical Record*, July, 29, 1874.

22. *Gerhardt's Percussion-Sign of Change of Pitch*.—Dr. A. WEIL directs attention to a percussion-sign first described by Gerhardt in 1859, and apparently seldom or never taken advantage of in the physical examination of the chest, namely, change of pitch of the tympanitic (*tympanitisch*) note yielded by a circumscribed spot of the thorax with change of posture of the patient (*Berliner Klinische Wochenschrift*, 1874, No. 7). The author is careful to distinguish this phenomenon of change of pitch from two others which may present themselves under different circumstances. The first of these is "Wimtrich's change of pitch," and is familiar as the alteration of pitch occasionally observed over pulmonary cavities, according as the mouth, or the mouth and nostrils, are open or shut. The second is "Biermer's change of pitch;" it is related to the phenomenon which is the subject of the present paper, and depends upon the alteration in the length of the longer diameter of a cavity (with fluid and gaseous contents), by alteration of the posture of the patient.

Gerhardt's phenomenon appears to differ from that last described only in respect of the circumscribed area over which it is elicited. In explaining its rationale, Weil says that a tympanitic note occurring at a limited spot of the thoracic wall cannot possibly change in pitch with the posture of the patient, unless there lie behind the percussed spot a sonorous cavity the longitudinal diameter of which is diminished or increased with alteration of the patient's position. And such a lengthening or shortening cannot possibly occur unless there be present in the cavity not only air but a mobile fluid, which, in obedience to the laws of gravity, ever occupies the lowest place. In other words, Gerhardt's phenomenon depends upon the same principles as Biermer's does in pyo-pneumothorax, and indeed, may be said to be present when the sign described is elicited over a limited pyo-pneumothorax.

Two interesting cases are recorded in illustration, both ending in a confirmatory *post-mortem* examination.

Weil maintains that this phenomenon is more than an interesting sign of the exact architecture of a well marked cavern; it is available for the recognition of a cavern when other "cavernous signs" fail. Not one of these so-called signs is exactly pathognomonic, and this objection will not apply to Gerhardt's phenomenon should it be discovered. It indicates with certainty the presence of a somewhat large pathological cavity filled with air and fluid. Unfortunately, in the majority of caverns, all the conditions for the development of the sign are not present; the cavern may be more of a spherical shape, or its walls may be very irregular, or the fluid may not possess the necessary mobility; or there may not be the proper quantitative relation between the elastic and the fluid contents. Finally, the sign may vary in its occurrence from day to day.—*London Med. Record*, July 22, 1874.

23. *Changes in Shape of the Red Blood Cells in Septicæmia and Fever*.—The peculiar tendency of the red blood cells to assume an angular, indented, or thorny shape, which Huter describes as a specific sign of septicæmia, and explains as being caused by the entrance of monads into the substance of the red cells, has been found by ARNOLD HILLER not only in typhoid fever, but in all diseases attended with fever. The latter author strenuously denies that this change in shape of the red cells is at all characteristic of the blood of any disease, and says that it is in every respect identical with the change which

occurs from exosmosis in the cells of normal blood, which has become concentrated by evaporation, or the addition of substances, such as sugar, salt, or gum. The proneness of the red blood cells to undergo this change in fevers, may be explained by the presence in these diseases of circumstances which facilitate its occurrence, namely, 1, diminution of the consistence of the cells themselves; 2, increase of concentration of the serum, more effete matter being thrown off by the rapid metamorphosis of the tissues; 3, and a high temperature which aids the concentration after the removal of the blood.—*Irish Hospital Gazette*, July 15, from *Centralblatt*, No. 21 *et seq.*

24. *Diphtheritic Paralysis*.—Sir. JOHN ROSE CORMACK, in a paper read before the British Medical Association, began by describing a minutely observed, very severe, but typical case of diphtheritic paralysis. The main object of the paper was to elucidate the natural history of the affection, which he looked upon as the true guide to the prognosis and treatment of each case—so far as a guide exists irrespective of the individual peculiarities of the patient, and the character of the disease in respect of the district, season, and race in which it occurs, and the constitution of the prevailing epidemic, should the disease be prevailing as an epidemic. The most skilful physician cannot cure pneumonia, typhoid fever, or diphtheria; but he can guide to recovery many cases of these diseases which would be lost by the routine administrator of remedies. Medicines are sometimes exceedingly useful in diphtheritic paralysis, as well as in the earlier stages of diphtheria; but in each case, and in each epidemic, we find that the efficacy of particular remedies varies with the variation in the therapeutic opportunities. The author regarded a generous easily assimilated diet in all stages and forms of diphtheria as generally the basis of the treatment; ferruginous medicines were nearly always useful, but, like all other medicinal agents, they had their times for being given and for being withheld. In diphtheritic paralysis, the persistent use of local stimulants and small blistering bands (according to a method described) constituted, perhaps, the most valuable treatment. Electricity had its opportunities, and was sometimes most useful. Change of air, the douche, and short courses of nuxvomica, were agencies which frequently gave a start to a lagging recovery. Still, we must never lose sight of the fact that the paralysis has a definite career to run; and that if the patient were only to eat and drink well and digest his aliment, he will, at the end of a longer or shorter time, be restored to health—provided always, of course, that no insuperable obstacle to recovery exist, such as implication of the muscles of respiration in paralysis. In discussing the pathology of the affection, the author referred to recent German and Italian physicians who had described necropsies in cases of diphtheritic paralysis, in which they found a structural change in the gray and white matter of the medulla, which some of them have termed *disseminated myelitis*. The author looked on these appearances in the cases referred to as secondary. Diphtheritic paralysis, though it has its own peculiarities and specialties, is similar in kind to the paralysis which we meet with as a sequel of typhoid fever, relapsing fever, scarlatina, and dysentery. In all, it is peripheric. Its invariable starting point is the velum pendulum palati; and that is a distinctive peculiarity between it and the paralysis following typhoid fever, relapsing fever, scarlatina, and dysentery.—*Brit. Med. Journ.*, Aug. 29, 1874.

25. *Diphtheria*.—Mr. T. PRANGLEY read a paper before the British Medical Association, founded on the observation of fifty-six cases of diphtheria which came under his care at Aylsham during an epidemic which prevailed in the summer and autumn of 1868. The cases had been of all degrees of severity. He regarded the amount of engorgements of and deposit on the tonsils as a valuable prognostic sign; and said that one of the worst signs was the extension of the disease to the nares. The propagation of diphtheritic membrane to the larynx was also an ominous symptom. Regarding the treatment, he said that in every case he applied tincture of iodine (48 grains to 3j) locally to every part of the throat covered with membrane, at least once in every twenty-four hours, and also ordered the inhalation of iodine-vapour with steam. The

general treatment was supporting and stimulating. Of his fifty-six cases, seven died, five of whom were moribund when he first saw them.

Sir JOHN CORMACK said it was not safe to found our treatment of diphtheria only upon what we ourselves may have seen and done. A practitioner may have seen in some particular locality, or in some particular epidemics, nothing but recoveries; and, if he have applied iodine locally, and given zinc or iron internally, he may be inclined to attribute the successful issue of his cases to the treatment which he pursued. Unless he be as conversant with the experience of others as with his own, he may long slumber under his delusion; but the time may come to him, as it has come to others, when, in spite of his cherished remedies, local and general, he will see a large proportion of the attacked perish from croup, or be saved only by tracheotomy performed in good time. The use of local applications to the throat of a diphtheritic patient is fraught with infinite danger to the applier. Many medical practitioners and medical students have received the diphtheritic poison in the spit of their patients, involuntarily ejected on the application being made. Promising young physicians and some elder men—celebrities in medicine—have died of diphtheria so contracted. If we do apply anything to the throat, we can only do it with safety to ourselves if we wear a mask. But all potent applications to the throat have ceased to be in favour with those who have seen most of diphtheria. They say that iodine, nitrate of silver, and the like, generally produce increased exudation; while in other cases, where the exudative tendency is moderate, they seem to do little or no harm. The only local application now used by the author is the glycerole of borax of the *British Pharmacopœia*. It promotes the separation of the pellicle, and does not irritate the mucous membrane. The appearance of albumen in the urine is not of itself of evil prognosis. In many cases in which the urine has been intensely albuminous we have complete recovery. Diphtheria is essentially characterized by intermittence in the gravity of the symptoms: a lull, often mistaken for the dawn of convalescence, is not at all unusual. After such a lull, as a prelude to an exacerbation of symptoms, we can usually, by the thermometer, detect a rise in temperature, and a concurrent appearance or reappearance of albumen in the urine. Touching the differential diagnosis of simple membranous sore throat from the specific disease diphtheria, the author thought that it could neither be determined by the presence nor by the absence of fever, nor by any other than one test—a test simple and sure. Apply a small blister to the arm or elsewhere: if the case be diphtheria, the said surface will become covered with a diphtheritic pellicle; if it be not diphtheria, no false membrane will appear. Mr. Prangley, in reply, said that as regards the pulse, temperature, and urine, he could not get any information from them which was valuable in prognosis. He had, in some instances, tried for a time treating the cases without any local application, but as they became worse, he subsequently resorted to this mode of treatment. He could not agree with Dr. Bradbury that two diseases may coexist in the body. He thought it better to consider the two forms as one and the same disease, and to impress upon the friends the importance of mild cases.—*Brit. Med. Journ.*, Aug. 29, 1874.

26. *Croton-Chloral in Certain Forms of Megrim.*—Dr. SIDNEY RINGER read a paper on this subject before the Section of Medicine of the British Medical Association. He included under the term megrim the affections commonly known as sick headache, bilious headache, nervous sick headache, and hemicrania. He described the phenomena of an attack: and, with regard to its pathology, said that, though the affection was seated in the nervous centres, the frequency and severity of the attacks depended on peripheral exciting causes. The treatment included that of the central nervous affection; the removal or prevention of exciting causes; and the treatment of the paroxysm. Having referred to bromide of potassium as being often useful in a twofold sense, Dr. Ringer said that, remembering how closely megrim is allied to neuralgia, and how useful hydrate of chloral is in facial neuralgia, he had been induced to try this remedy in megrim, and had found it useful in cases of the continuous form.

Dr. Ringer further said that croton-chloral may be given in doses of five, ten,

or fifteen grains. He had given ten grains every hour for a fortnight without any unfavourable symptoms. He recommended five grains every three hours in ordinary cases of megrim, and the same quantity every two hours in severe attacks. With regard to the use of *combination* of drugs in megrim, he said he had found cannabis Indica, in conjunction with other drugs, the most useful form. Dr. Ringer had not found phosphorus successful.—*Brit. Med. Journ.*, Aug. 29, 1874.

27. *Subcutaneous Injection of Chloral in Spasmodic Asthma*.—Surgeon Major BAILLIE extols (*Indian Med. Gaz.*, June 1, 1874) the efficacy of chloral administered subcutaneously for the relief of spasmodic asthma, and records the following case in which it was used by Sub-Assistant Surgeon Nocoor Chunder Banerjee:—

“A scantily-clothed woman was carried into the dispensary one cold morning and deposited on the floor, her painful efforts to breathe absorbing all her attention, and rendering her quite unable to give any account of herself; from her friends it was learnt that she had been suffering for some weeks past from more or less difficult breathing which had culminated in the present most severe attack some twenty hours previously. Solution of chloral containing three grains in twenty minims of water, was at once injected subcutaneously at the back of the neck with so much advantage that, ten minutes later, the spasm had entirely ceased, and easy natural respiration had taken its place; the woman expressed her sense of the relief afforded her, and half an hour afterwards, walked off to her house with her friends; she was seen again a few days later, having remained quite free from the affection, and as she has not been heard of since, it is probable that the attack has not recurred.

“Several other cases of less severity than this have been also treated with equal benefit.”

28. *Atropia in Phthisical Sweating*.—Dr. JAS. M. WILLIAMSON gives (*Lancet*, July 25th, 1874) the results of his experience in the use of atropia in sixteen cases at the Royal National Hospital for consumption, Ventnor.

“The sulphate of atropia,” he says, “is best presented in pill, with extract of gentian; watery solutions are not to be depended upon, for they soon spoil by keeping. The first dose should in no instance be larger than one-eightieth of a grain, and, guided by the results, the dose may if necessary be increased to one-sixtieth, or even one-fiftieth of a grain; but if this latter quantity be exceeded, well-marked symptoms of poisoning will almost certainly ensue.

“In each of the sixteen cases in which the remedy was tried, the first dose produced a distinct effect on the perspiration, either wholly arresting it or materially diminishing it. In only one-fourth of the cases, however, was this effect direct and permanent; that is to say, only four patients, after using the pills for a varying number of nights, were able to omit the remedy without the sweating returning. But in these four the effect was lasting, for when seen two months after the cessation, each patient reported that he was still free from the slightest dampness. Of the remaining twelve cases, four found the benefit direct but temporary; that is to say, they obtained complete relief on those nights on which they took the atropia, but the perspirations returned if the pill was missed. In seven cases, although the eightieth of a grain at first diminished the sweatings, the dose had to be increased to maintain the effect. At last, however, the increasing habituation to the drug which characterized the sweats did not hold good of the toxic symptoms, for these became so marked that the remedy had to be abandoned in all the seven cases, without its having succeeded in putting a stop to the sweats in a single instance. Only one case remains, and here there appears to have been an unusual sensibility to the action of the drug. The eightieth of a grain distinctly lessened the profuse sweating each time it was tried, but after three or four attempts it had to be discontinued on account of the severe symptoms of poisoning to which it gave rise.

“It will thus be seen that the remedy controlled the perspirations more or less in the whole of the sixteen cases; that the effect was direct and permanent

in four; direct but temporary in four; beneficial but transitory in seven; and that it was inadmissible in only one instance. These results will be all the more striking when it is added that in many of the cases the sweatings had extended over a period of several weeks, and had resisted all the ordinary methods of treatment.

"The toxic symptoms most frequently complained of were intense heat and dryness of the throat during the night, and indisposition for bodily or mental effort on the following morning. Vomiting sometimes occurred, but diarrhoea was not observed. In one case there was retention of urine for several hours. The pupil was sluggish in action, but distinct dilatation was not common except in those cases where one-fiftieth of a grain was administered. The patients often complained of dizziness and inability to read any print but that of large type.

"It is well known that all efforts to check the night-sweats of phthisis too frequently fail; and although it is not urged that the sulphate of atropia is less uncertain than other remedies, it is believed that it will not be found inferior to them in obstinate cases, in some of which it was of much service after all other remedies had failed. The drug would probably prove of extreme value in combating the perspirations in those diseases (such as acute rheumatism) in which the sweating extends over a comparatively short period, and is not so inveterate as that in phthisis."

29. *Hydrophobia treated by the Intravenous Injections of Chloral*.—M. BUCQUOY reported to the *Société Médicale des Hôpitaux* a case of rabies in a man following the bite of a rabid dog. Several injections of a solution of chloral in water were made into the right radial vein with temporary relief to the symptoms while under the influence of the chloral; but without warding off a fatal termination. On the autopsy no coagula were found in the veins. M. B. concludes that chloral acts like chloroform inhalations, during the sleep from which the rabid spasms are suspended, but that it is as fruitless for a cure as other remedies.—*Gazette Hebdom.*, 17th July, 1874, also *L'Union Médicale*, July 25, 1874.

30. *Treatment of Cholera by Subcutaneous Injection of Chloral Hydrate*.—The supplement to the *Gazette of India* of February 14th, 1874, contains a report on this subject from Dr. HIGGINSON, to Dr. HALL, the latter of whom claims the merit of having originated this method. In a letter to the Commissioner of Sitapur, dated October 18th, 1873, Dr. Hall states that, in the *Indian Annals of Medical Science* for March 1870, he advanced the theory that, in the collapse stage of cholera, there was intense irritation of certain sets of nerves; and that hence the use of sedatives was indicated. These, he recommended, should be given by hypodermic injection; it being of little use to give medicines by the mouth. Subsequently, having, in conjunction with Surgeon-major Collis, ascertained by experiment the powerfully sedative action of hydrate of chloral, he tried the remedy with success on a soldier in the collapse of cholera—recovery being established in about five hours. He gives the following direction for the use of the medicine.

"I attach great importance to the strength of the solution used (one part in 10 of water); if it is too strong, it probably will not be absorbed into the blood, and only cause ulceration or sloughing.

"The following is the plan of treatment that I recommend for the three stages of cholera. During the premonitory diarrhoea (which is almost always painless), 30 drops of dilute sulphuric acid in a large wineglassful of strong camphor-water every hour. If this does not stop it, and vomiting comes on, commence the hypodermic injection at once. If the patient is first seen in collapse, inject 10 grains dissolved in 100 drops of water in four or five different places, according to the size of the syringe. This will probably be enough; but, if reaction does not commence within an hour, inject again. There is generally a great craving for cold water, which may be given in any quantity. Never mind if the patient vomits; as reaction proceeds, he will retain it. But no opium or stimulants are to be given in collapse.

"After reaction, if secondary fever supervenes, quinia in varying doses, every one or two hours, may be given with milk, beef-tea, and mild stimulants."

Mr. Higginson, in his report to the Deputy Commissioner at Kheri, states that he has treated nineteen cases of cholera according to the method recommended by Dr. Hall, and that death had occurred in only two of these; one being a case in which the directions were not properly carried out, and the other an exceedingly severe and rapid case. The seventeen patients who recovered were in various degrees of collapse when first seen. Regarding the manner of administering the remedy, he says:—

"The injections were made in the arms and thighs, the canula of the syringe being plunged pretty deeply into the flesh. The greatest quantity of chloral used in any of my cases was sixteen grains, or eight injections. If the case was a bad one, four injections were made at once; then nothing was done for an hour, when the treatment was repeated if necessary. As a rule, sleep was induced within two hours. Nothing else was done except mulling (shampooing) the limbs, and giving occasionally some cold boiled water."

The result of the treatment is thus described by Mr. Higginson.

"Chloral hydrate, being a powerful sedative, soothes the irritated nerves, and so relaxes the contracted vessels; the blood is once more uniformly distributed, and consequently the pulse reappears at the wrist; the cramps and burning abdominal pains subside, sleep is induced, the respiration becomes regular, the discharges lessen, the face fills out, the voice becomes stronger, and the natural secretions are restored."

The success with which Mr. Higginson has met (the recoveries amounting to 89 per cent.) is certainly such as to encourage a further trial of the hypodermic injection of chloral hydrate in cholera. At the same time, much more extensive observation is required before any definite conclusion can be arrived at as to the value or inutility of the treatment. We shall watch with interest any additional observations on this important subject.—*British Med. Journ.*, Aug. 22, 1874.

31. *On Acute Rheumatism treated by Chloral Hydrate.*—The following interesting history of a very severe case of acute rheumatism occurring in a boy of H. M. S. *Cambridge*, is thus given by Staff-Surgeon A. IRWIN of the Royal Navy Hospital at Plymouth (*Navy Health Report*, 1874). The boy, aged 16, was admitted from H. M. S. *Cambridge* on November 26, 1872, suffering from acute rheumatism, engaging the wrists, elbows, knees, hands, and ankle-joints, with high temperature, but without cardiac complication. He was treated, as has been customary in this hospital, with a mixture containing bicarbonate, acetate, and nitrate of potass., in effervescence; and an alkaline lotion with opium, to the affected joints. He progressed favourably up to December 5, when he became exceedingly restless, and complained of much frontal pain, and his countenance wore an anxious expression. In the evening he was in a state of busy delirium, and symptoms of acute meningitis were conclusively present; at the same time all the articular symptoms disappeared. Enemata were administered, cold to the head, and blisters, without the smallest relief. He was supported carefully with milk, beef-tea, and a fair allowance of wine. His pupils were dilated and almost inactive. He was restless, and continually tossing his arms about. He continued about 48 hours in the above state, and on the morning of the 7th had been without sleep; his pulse was 152, and very weak; his temperature 102.6°. He was then ordered draughts containing twenty grains of chloral hydrate, with syrup of ginger; one to be taken immediately, the others at such intervals as might be required. Soon after taking the first draught the muscular twitchings, or tossing about, ceased, and he eventually fell into a quiet sleep. He passed the day and night tranquilly, taking his nourishment at intervals, and on the morning of the 8th was quiet, rational, and comparatively comfortable; but about 2 P. M. there was a return of the unfavourable symptoms (less in degree). He was given half a chloral draught, which quickly composed him, and from that time to the present there has not been any return of head-symptoms. The rheumatic affection relapsed, both knees becoming painful to the touch, and swollen. He steadily improved

from his extreme prostration, and was convalescing, but suffered from organic cardiac disease, which must unfit him for further service.

"He had no recollection whatsoever of the *Cambridge*, the ship from which he was sent into hospital, nor of any circumstance immediately preceding his illness. The case is remarkable—first, for its rarity; secondly, from the fact of the disease being almost invariably fatal; and thirdly, for the good effect produced by the administration of the chloral hydrate."—*London Med. Record*, July 15, 1874.

32. *Effect of Warmth in preventing Death from Chloral*.—Dr. T. LAUDER BRUNTON calls attention (*Journ. Anat. and Phys.*, May, 1874) to the "diminution of temperature which chloral induces, and the extraordinary effects of warmth in hastening recovery from its action, and preventing death from an overdose. The fall of temperature has been noticed by Liebreich and most other writers, but the effect of warmth applied to the animal's body has not, I think, received sufficient attention, although Dr. Richardson has pointed out its usefulness in preventing death. The diminution of animal heat is partly due in all probability to greater loss from the surface caused by the vessels of the skin becoming much dilated under the influence of the drug, and allowing the blood to be cooled more readily by a low external temperature. It is partly due also to the diminished production of heat which cessation of muscular action always causes, whether it be induced by simply tying down an animal so as to prevent motion, or by the administration of curare or narcotics.

"Professor Stricker having noticed that the animals on which he experimented often required a second dose of chloral to maintain anæsthesia, when they were wrapped in cotton-wool so as to prevent loss of heat, and still more when they were laid in a warm place, I made the following experiments at his suggestion. They show clearly that an animal wrapped in cotton-wool may recover perfectly from a dose of chloral which is sufficient to kill it when exposed to the cooling action of the air (which in the laboratory was about 20° C.), and that recovery from the narcotic action is much quicker when the temperature is maintained in this way, and still more rapid when the animal is placed in a warm bath. If the temperature of the bath is too high the animal may die from excessive heat, as I have shown in a former paper.¹

"The bearing of these experiments on the treatment of persons suffering from an overdose of chloral is so obvious as hardly to require any observations from me. The patient should be put to bed, and the temperature of the body maintained by warm blankets and hot-water bottles to various parts of the body, and especially the cardiac region. Warmth over the heart is an excellent stimulant to the circulation, which, like the respiration, is enfeebled by chloral, the heart, according to Rajewsky, being more or less paralyzed by the drug. If respiration threatens to fail, it should be maintained artificially, so as to allow time for the chloral to be excreted and the normal functions to be restored."

33.—*Hydrophobia; supposed Two and a Half Years' Incubation*.—Dr. FÉREOL, at a meeting of the French Academy of Medicine, on the 21st of July, read a long account, afterwards published in full in *L'Union Médicale*, July 30th, of the case of M. Durieux, a *pharmacien*, æt. 48, who was admitted in the *Maison de Santé* with symptoms of commencing hydrophobia, which speedily became confirmed. Death occurred on the third day, and beyond some cerebral and spinal meningeal congestion nothing special was found at the autopsy, which was performed with the greatest care. The patient stated that he had been bitten in the hand two years and a half ago by a mad dog, and subsequent inquiries have confirmed this statement.

M. Féréol, convinced that his patient died of true hydrophobia, reviews at great length the various affections with which this may be confounded. Treating of "nervous hydrophobia," he refers to a remarkable case which fell under M. Demarquay's notice. A student at the *Hôtel-Dieu*, having been greatly

¹ "On the Effect of Temperature on the Mammalian Heart and on the Action of the Vagus." St. Bartholemew's Hospital Reports, vol. vii. 1871.

affected by the suffering which he had witnessed in a patient dying of hydrophobia, had the misfortune as he was leaving the hospital to be himself bitten by a dog. He returned in a state of desperate alarm, and had the wound thoroughly cauterized, declaring that within six weeks he should return to die in a state of horrible suffering which he had just witnessed; and, accordingly, at the period indicated he did return with all the symptoms of hydrophobia developed. As he was still alive at the end of the forty-eight hours, when the patient whom he had seen had expired, M. Demarquay joked him, declaring that, as he had passed that period, he had not the disease, and had nothing to fear. These words inspired the youth with hope, his symptoms abated, and he recovered. That the patient was suffering in some analogous manner is rendered highly probable by a statement made by Baron Larrey at the next meeting of the Academy. During the siege of Paris, he observed, this M. Durieux (who, besides being a *pharmacien*, had a medical diploma) became well known to him as an applicant for employment in the ambulances. From the first he remarked his zeal and ardour, as well as his excited state and language. He seemed to seek to brave all perils in order to distinguish himself; and his excessive anxiety to obtain the Cross, and his tumultuous joy on succeeding, made a great impression on M. Larrey. "I lost sight of him afterwards," he observes, "always remembering him, however, as one of the most restless, the most agitated, and the most excitable beings with whom I had ever come into contact. Did he not then present a moral predisposition to the manifestation of the neurosis, which ended in a fatal hydrophobia? For my part, I should be disposed to regard his case, not as an example of rabies with an incubation of two years and a half, but as one of cerebral hydrophobia, or symptomatic of acute delirium provoked or aggravated by the coincidence of the bite of a dog presumed to be mad."

SURGICAL PATHOLOGY AND THERAPEUTICS AND OPERATIVE SURGERY.

34. *On the Bloodless Method.*—Prof ESMARCH observes that since he first brought the subject before the third Surgical Congress, in Berlin, he has had the opportunity of trying his method in 200 additional cases, and that he now entertains a much higher opinion of its utility than he did then. Not wishing to weary his audience with mere statistical details, he yet feels desirous of pointing out the influence which he believes the method exerts in diminishing the mortality of large operations. Thus, of thirteen amputations of the thigh he has only lost one, and the same with respect to eleven amputations of the leg, while four of the upper arm all recovered—so that in twenty-eight of the greater amputations there occurred only two deaths. An amputation of the shoulder succeeded, but one of the hip-joint, which from the first was almost hopeless, failed; and of eight excisions of the large joints (three of the hip, three of the knee, and two of the elbow) only one terminated fatally. These are favourable results that cannot readily be surpassed. His clinical wards are contiguous to the medical wards, and both have long been overcrowded, and erysipelas, diphtheria, and pyæmia have been often met with. He is under the conviction that the more favourable results of the present year are due to the adoption of the bloodless method. This presents the following advantages:—

1. The small loss of blood which takes place. Every one is aware how convalescence is retarded and endangered when the loss of blood has been large. The production of acute anæmia here is the great danger. The coagulability of the blood augments in many cases with the impoverishment of the red globules, and with this increases the danger of thrombosis and pyæmia.

2. Sponges need not be brought in contact with the unbleeding surfaces. Although he has always been very careful not to use sponges that have not been thoroughly cleansed and disinfected, yet Dr. Esmarch has still suspected that they have still had something to do with transporting contagious material, and especially the poison of erysipelas.

3. The large arteries and veins are not subjected (as they are when the tourniquet or digital compression is employed) to violent local pressure. They are equally compressed on every side by the entire mass of the soft parts being inclosed in the ligature.

Disadvantages of the method Prof. Esmarch has not met with himself, and, especially, he has not seen paralysis as a consequence of the ligature; and he believes that when this has taken place in the hands of others, it has arisen from too powerful an application of the caoutchouc tubing. Indeed, he has had to prevent his own assistants committing this error. All kinds of caoutchouc are not suitable, and he prefers the brown, non-vulcanized, and tubes or rollers made of the red caoutchouc; and in general no great force is required to completely prevent the afflux of arterial blood. The first turn should especially not be too forcible, as each succeeding one considerably increases its effect. Any one may be easily convinced of this by passing a fine caoutchouc bandage several times around the same part of a finger. He has never met with gangrene of the flaps reported by some surgeons, and thinks this has been dependent upon other causes.

Additional advantages of the method are referred to. Thus, as a consequence of the local ischæmia and compression of the nerves, a local anæsthesia is induced, rendering operations but slightly painful. In the out-patient establishment, at Kiel, it is almost always resorted to for small amputations, incisions, removal of nails, etc. Generally the anæsthesia does not occur until some minutes after the application, but if Richardson's spray-douche be used it is quickly induced, as the freezing is infinitely more quickly brought about when the arteries no longer bring additional caloric with the blood.

The method allows of a thorough examination being made of diseased parts, especially in the bones and joints. On many occasions Prof. Esmarch has examined these as deliberately as in the dissecting-room before he decided whether he would perform excision or amputation. He has thus frequently been able to assure himself of the various alterations on the living body, and has submitted portions to the microscope before he would decide on operating. The same assistance is derived in the removal of small foreign bodies, such as needles, glass, splinters, etc., which have become embedded in the hands or feet; and every one knows how a constant stream of blood aggravates the difficulties in these cases, leading in some cases to the abandonment of the attempts. Now, if the situation of the body be but known, it is removed with the greatest ease, and the slight wound necessary for this usually heals by the first intention. Of the great facility with which the ends of wounded arteries may now be found, Leisrink and Stokes have published remarkable examples.

Another advantage greatly to be prized is the fact that many of the great operations can be performed without any skilled assistance whatever—a fact of importance not only in military surgery, and for surgeons when alone on board ship, but still more so for practitioners in the country and in small towns. Many are the thankful communications on this head which the Professor has received from his pupils scattered about in country parts. One of them, not having the apparatus with him, employed a linen binder and his elastic braces during the easy extraction of a splinter of glass which was embedded in the arm. It is very desirable that officers and soldiers going into battle should have elastic braces capable of being used in the arrest of hemorrhage on emergency. Professor Müller, of Würzburg, suggests that in a woman dying of hemorrhage the ligature might be applied to the four extremities so as to force the blood towards the trunk and head, thus warding off collapse and giving time for transfusion, or enabling us to dispense with this.

By means of the ligature, which may be applied at any part of the extremities, lay persons are in the position of being able to control accidental hemorrhage, no knowledge of the places of the arteries being required, as for the application of the tourniquet. As Professor Langenbeck has remarked, in most cases an elastic bandage will answer the purpose as well as the caoutchouc tube, while its pressure is gentler and more uniform; but still there are cases in which the tube cannot be thus superseded owing to its smaller size. Prof. Esmarch cannot agree with those who think that his method is not suitable in

operations upon the shoulder and hip-joint, having himself employed it in several of these with complete success. In operations upon the shoulder, blood may be prevented passing through the axillary artery by carrying the tube under the axilla, drawing it tight over the shoulder, and keeping it in a state of tension by a strong fist supported by the clavicle. Or both ends may be held together by a clamp, like that used for fixing the pedicle in ovariectomy. Bringing the tube across the chest and back to the opposite axilla, as was at first done, is objectionable, on account of the interference with respiration that is produced. In amputations at the upper part of the thigh the tube may be passed firmly once or twice around the limb just under the bend of the thigh, crossing the ends over the inguinal region and carrying them around the posterior surface of the pelvis and uniting them over the lower part of the abdomen. Or a binder may be firmly rolled up and applied as a pad over the external iliac above Poupart's ligament, and compressed by several turns of a strong caoutchouc bandage. In operations upon the hip-joint itself, however, such a bandage would be in the way, and we must then compress the aorta in the umbilical region. This can be done by means of a pad formed of a linen bandage eight metres long and six centimetres broad. This is wound around the middle of a wooden staff the thickness of a thumb, and a foot in length, which enables the pad to be retained in its right position. The pad is applied immediately under the umbilicus, and is compressed powerfully against the spinal column by five or six turns of a caoutchouc bandage six centimetres in breadth. By this means the flow of arterial blood through the aorta can be completely arrested, provided care has been taken beforehand to empty the intestinal canal by means of purgatives and enemata. In some cases it is preferable to employ a pediculated pad, which allows of its being pressed deeper into the abdomen. Prof. Esmarch has had a slit made in the steel pedicle of his pad (*pelote*), through which the turns of the caoutchouc binder can be easily passed. Several persons have recommended raising the limb for some minutes prior to the operation before applying the compressor, but this is by no means of the same utility as the methodical application of an elastic bandage. The only cases in which the raising the limb is of advantage are those in which the presence of foul secretions renders it inadvisable to force them by the bandage into the cellular tissue and lymphatic system. It is very desirable, in cases in which there are open wounds, ulcers, or fistulæ of the extremities, that these should not only be covered with varnished paper, etc., but that pure caoutchouc bandages only should be employed, because these are much easier cleaned than are those in which silk or cotton enter into the composition.—*Med. Times and Gaz.*, June 20th, from *Wien. Med. Woch.*, May 16th and 28th, 1874.

35. *On Simple Ligature as a Means of Preventing Loss of Blood.*—In *Lo Sperimentale* of June, 1874, Dr. COLLETTI makes a brief communication to the following effect.

He had occasion to perform amputation of the thigh on a man who had his leg crushed by a large block of marble. The patient had already lost much blood when he was brought to the hospital. Dr. Colletti applied three turns of a narrow bleeding bandage round the upper part of the thigh; this had the effect of arresting the hemorrhage, and amputation was performed almost without loss of blood. The large vessels were tied; on removing the bandage hemorrhage took place from one small artery only, and was arrested by torsion. Dr. Colletti relates the case to show that an *elastic* cord is not absolutely necessary.—*London Med. Record*, July 22, 1874.

36. *On the Production of Anæsthesia by Compression.*—At a sitting of the *Société de Chirurgie de Paris*, held June 21, M. LE FORT read a communication on some cases in which he had obtained surgical anæsthesia by the sole employment of compression by the method of Esmarch; he attributed this effect to the energetic compression of the sensory nerves by the constricting band placed round the root of the limb. He considered that there was here a most valuable agent in producing anæsthesia, should the feeble condition of the patient not permit the use of chloroform, or demand the least possible loss

of blood. In the discussion, M. DEMARQUAY said that he had already attempted to induce anæsthesia by ischæmia, by applying Esmarch's apparatus in patients afflicted with varices of the lower limbs, but that he had found on removing the bandage that the sensibility continued, though considerably duller. M. Demarquay had in his cases suppressed the constrictor band placed on the root of the limb, and it was to this that M. Le Fort attributed the complete results he obtained; in a word, M. Demarquay kept within the bounds of producing anæmia of the limb, while M. Le Fort directly suspended the nervous action by the energetic constriction to which he submitted the nerves, by concentrating this constriction upon a limited portion of their extent. M. VERNEUIL, from the experiences he had had of Esmarch's method, had determined, 1st, that complete ischæmia, produced by pressure for fifteen minutes, admits the persistence of sensibility; 2d, that after removing the apparatus it manifests itself some time after the operation, a consequence no doubt of the paralysis of the capillaries produced by the pressure, the free loss of blood necessitating the ligature of a lesser or larger number of arteries; there is therefore an exaggeration in saying that, owing to Esmarch's apparatus, operations can be performed without the loss of a single drop of blood. If the wadding dressing be applied after similar operations, the oozing of blood which occurs soaks it and renders it defective, so that the intention of the method of dressing by occlusion would be, according to M. Verneuil, analogous to that of Esmarch.—*London Med. Record*, July 29, 1874.

37. *On the Mechanism of Hernial Strangulation.*—Dr. HERMANN LOSSEN (*Centralblatt für Chirurgie*, No. 4, 1874) states, that "for the reduction of those cases of hernia in which, from inflammatory swelling, a protruding intestine has so much increased in volume that it cannot be pressed back through the same aperture by which it protruded, there exist two rival theories—Roser's valve theory, and Scarpa and Busch's theory of pinching of the intestinal canal. To decide whether either of these be correct, and if so, which is the more so, I repeated Busch's experiments with fresh pig's gut; but, instead of water, I used melted wax which, on cooling, became a solid mass. The hernial apertures were represented by holes bored through the lid of a cigar box, through which a finger might pass. The casts of the loops after removal of the artificial hernial rings were now embedded in wax of another colour, and vertical sections made through them. In the same fashion a number of loops inflated with air were artificially strangulated and then dried."

The following results are demonstrated by these preparations and experiments:—

1. At the moment when the wax, or air, or, in the living gut, the fecal matter, enters the afferent end, the efferent portion of the gut, at the level of the hernial aperture, is pressed together, and by the constantly increasing pressure is finally completely closed.

2. This being accomplished, no pressure, however great, coming from above, will re-open the distal end of the gut.

3. The pinching (*Abknickung*) of the intestine, which is principally referred to the opposed folds of mesentery, is not the cause, but the consequence, of this closure.

4. The afferent end is never closed, which appears to contradict the hydrostatic law that in a closed space lateral pressure acts equally in all directions, and perpendicularly to the surface. According to this law, the pressure in a strangulated loop must exist up to the level of the hernial ring; and above it, in the afferent piece of intestine, a diminution or increase of pressure must manifest itself equally in all directions.

This may be demonstrated with extreme facility by means of a manometer attached to the afferent end of the artificially incarcerated loop of intestine. It may be shown in this manner, beyond all doubt, that in the living intestine the whole column of excrement presses upon the contents of the bowel in the strangulated loop. Therefore the pressure on the sides of the loop will depend upon the height and length of this column, and upon the resistance the intestine offers to the pushing back of the fecal contents. The height of this column

may become considerable by reason of the long continuance of the strangulation. During this time the pressure constantly augments, but it possibly may be reduced by severe fecal vomiting. The impediments arising from friction are the most important. These, from the very outset, are in inverse proportion to the transverse section of the hernial aperture; they depend further upon the viscosity of the contents of the bowel, upon the number of "pinchings" of the intestine occasioned by the gradual swelling of the convolutions of the bowel above, and also upon the contractile force of the pylorus and of the ileo-cæcal valve. They increase with the increasing peristaltic motion and swelling of the intestinal coverings, in consequence of which the afferent end may ultimately assume the minimum transverse section.

The author's observations and experiments show how great the lateral pressure upon the loop may become. It is manifest that the maximum of lateral pressure immediately above the hernial aperture must be attained at the time when that pressure equals the sum of the resistance due to impediments in the whole upper tract of the bowel. From this moment must commence a backward motion of the contents of the bowel, the fluid particles flowing back in the axis of the canal, whilst along the walls the peristaltic influence will urge the matter forward. In the strangulated loop these movements are reversed, and maintain the equipoise. Under these circumstances the pressure does not further increase.

In the living subject the resistance is much greater than in the dead, in consequence of the peristaltic action, the viscid nature of the bowel contents, and the smaller size of the hernial aperture.

The manometer shows that every species of direct pressure upon the tumour increases the tension, and aggravates rather than improves the condition of affairs. Neither Roser's nor Busch's theory explains this. It is the lateral pressure at the orifice of the sac which alone prevents reposition.

A rational taxis then will renounce attempting any alteration at the afferent end. The efferent end is the one to be opened. This is to be effected, Dr. Lossen says, as I am in a position by the manometric experiment to prove, by pressing the loop of intestine towards the side of the afferent end. The efferent end is by this means opened, and the loop partially empties itself, then a slight pressure upon the hernial swelling is sufficient to effect reduction.

Seeing that no practical diagnostic means are known whereby it can be accurately ascertained at what side, the right or left, the upper or lower, the efferent end may lie, the author recommends that sideward movements of the hernial swelling be carried circularly round. If this end be not attainable, an external herniotomy may be made, and then similar manipulations again tried before incision of the ring.

From the preceding it is also clear that, in the internal treatment, laxatives must not be administered, and that large doses of opium are to be commended immediately after the occurrence of strangulation. The peristaltic action will be thereby lessened, and thus one provocative of lateral pressure eliminated.

[Dr. William MacCormac had the gratification of seeing Dr. Lossen's striking and conclusive experiments at the late Surgical Congress, in Berlin, and he has since repeated some of them himself. The attempt to draw down a strangulated hernia, which is sometimes successful in effecting reduction, probably is so by thus opening up the distal end of the strangulated loop. The experiments of Dr. Lossen are simple, and easy of execution by anybody who will procure a piece of intestine, cut a half-inch round hole in a cigar box, and provide himself with the means of inflating the gut with air or fluid. The subject is one of very great interest.]—*London Medical Record*, July 8, 1874.

38. *Treatment of Syphilis*.—Prof. VON SIGMUND, of the Vienna General Hospital, addressed an interesting communication to the *Giornale Italiano delle Malattie Veneree* for February, having for its title "On the Suitable Time for Commencing the General Treatment of Syphilis, and on the Choice of the Method of Treatment." As the result of his prolonged experience and observation, he lays down the following rules: 1. The methodical general treatment of syphilis should, as a rule, be commenced when undoubted signs of the

general disease are manifested in organs situated at a distance from the point by which the contagion obtained access. 2. For this general treatment, mercurial preparations should be preferred to all other therapeutical means. 3. The treatment should be continued, uninterruptedly or periodically, according to circumstances, as long as the symptoms of the disease persist or reappear. 4. The phenomena of other concomitant diseases should be treated according to their indications, precisely as if syphilis did not exist. 5. A hygienic regimen accurately adapted to each case constitutes a fundamental rule of treatment, and the diet of the patient should, as a general rule, be decidedly tonic.

In some cases in which appropriate treatment of the primary local forms has been adopted, unimportant consecutive forms only succeed, or these may be entirely wanting. A moderate amount of infiltration of the lymphatic glands, a passing erythema of the skin and the mucous membrane of the palate and pharynx, and at the most a little tumefaction of the tonsils, with slight febrile action, and sometimes rheumatoid pains, then constitute the exhibition of the disease. By the sole use of non-specific remedies, with a properly adapted diet, the whole of these symptoms usually disappear, with the exception of the glandular tumefaction, which also, in the course of some months, becomes considerably diminished. These cases are especially observed in the female sex. Now, if during this period specific remedies are resorted to, of what value can such cases be as statistical data? The spontaneous cure of syphilis in the sense indicated can only be called into doubt by those who cannot or will not observe. The necessity for general treatment, even before the appearance of the general forms, exists, on the other hand, when we have to do with pregnant women or with local forms, which produce, without any other cause for them being discoverable, extensive indurations or rapid destruction of the skin and connective tissue. In pregnant women, who moreover often present similar infiltrations, and in whom we have always to take into account the disease and death of the fœtus, general treatment should be commenced as soon as possible.

As to the choice of mercurial preparations for general treatment, this may be decided according to personal circumstances; but as a fundamental rule preference should be given to those employed externally, and that especially because of the greater certainty of the results obtained. Fumigations, although warmly recommended of late, present greater difficulties than do frictions and injections. Although Dr. von Sigmund has, from prolonged experience, become a determined defender of the treatment by frictions, he is willing to allow that there may be advantages in the employment of injections. They may be tried, and will oftentimes suffice, and when they fail recourse can still be had to frictions. For the most part, however, patients object to them, although the pain they cause is slight, and the abscesses they may give rise to are of little importance. During the last two years he has employed injections of calomel, as recommended by Professor Scarenzio, with sufficient frequency to enable him to pronounce favourably upon it as compared with the sublimate. By employing small doses of calomel the production of abscesses is prevented, and the continuous treatment which this permits secures a better result. Neither by this nor any other mode of treatment, however, can we give security against relapses. These, which are often only ulterior developments of known forms, and generally to be explained by individual peculiarities of the patients, must be treated just as the earlier forms. In the treatment of all cases of syphilis it cannot be sufficiently recommended that we should guard against "furiously assailing them with medicine" and the neglect of the surveillance of the patient's hygiene and diet. The promotion and maintenance of the physiological functions are of far more importance in the treatment of syphilis than the employment of any pharmaceutical substance. Of iodine as an anti-syphilitic remedy Dr. von Sigmund entertains a very low opinion, believing it only capable, like various other remedies, of removing or mitigating the complications of syphilis, and by isolating it rendering its treatment more easy, and also of relieving some of the symptoms of mercurialism.—*Med. Times and Gazette*, June 6, 1874.

39. *Excision of Cancer of the Breast by Scissor-Cutting under Ether Spray.*—An extremely interesting case of this is recorded (*Lancet*, Aug. 29, 1874) by Dr. B. W. RICHARDSON.

A lady, æt. fifty, consulted him in April last, with a hard scirrhus tumour of her left breast, loosely held in the gland. The propriety of removing it while yet easily movable was apparent; but then the question of the administration of an anæsthetic came under consideration. The action of the heart of this lady was so intermittent and irregular, and the power of her heart was so reduced, that the slightest external impression influenced it in its motion. She belonged, in a word, to that population which is prone to die suddenly from chloroform and other narcotic vapours.

Under these circumstances Dr. R. proposed that the tumour should be removed by local anæsthesia, and, accordingly, he operated on the 8th of May in the following manner:—

The patient having been placed in a semi-recumbent position on a narrow couch, I directed Mr. W. Perkins, who very efficiently conducted the local anæsthesia, to direct gently over the tumour a large spray of common ether, so as to chill thoroughly but not to freeze the skin. I let him maintain this for a period of five minutes. Then I handed to him another tube and bottle for spraying over the already chilled part the light fluid called anæsthetic ether—a compound of ether of sp. gr. .720 with hydride of amyl. A few moments' application of this lighter ether was sufficient to render the whole of breast frozen like a hard snowball. For a minute longer, that the deeper structures might become equally chilled, the spray was continued. When the structures were thus prepared, instead of using a scalpel for cutting, as in the ordinary way, I made the required incisions through the skin with a pair of small, strong, sharp, slightly-curved scissors. Commencing the incision by an angular cut at the outer margin of the part to be excised, I carried the lower blade of the scissors deeply into the breast with the edge of the blade everted. In this way I cut the lower flap; then, commencing at the same angle, I cut in the same manner the upper flap. The rapidity and ease with which these incisions through the hardened tissues were made struck me most favourably. The incisions were deep enough to enable me to grasp the tumour firmly with the left hand. I now laid down the ordinary sharp-cutting scissors, and with a pair of strong, slightly-curved, tooth-edged scissors, I proceeded to cut on each side of the tumour until I could fairly lift it up; then, by a few strokes made with the same scissors underneath, I cleared it completely away. The operation lasted precisely three minutes, and was unattended, during the whole time, by the escape of blood. The diseased mass removed, I had the ether spray withdrawn, in order to see if any vessels would bleed during reaction from the freezing. There was a little oozing of blood, which quickly subsided, and one artery was tied, both ends of the ligature being cut off close to the vessel. The wound, carefully cleaned with a soft, damp sponge, was closed: the edges of it were secured with five sutures; a pledget of cotton-wool, charged with styptic colloid, was placed over the wound; and a lint-pad and firm bandage completed the dressing. The patient passed a good night after the operation. She was allowed to rise and go into the drawing-room on the following day; and as she exhibited no rise of temperature beyond 99° Fahr., and that only for a few hours, and suffered from not one untoward symptom, the dressing was left untouched until the 13th of May, when, on removing it, the wound was found healed throughout its entire extent. The sutures were removed a few days later, when the line of incision was found fairly closed, without a particle of discharge or interruption of healing at any point.

During the operation the patient did not utter a single expression of pain, and afterwards stated that "during the application of the ether spray the local feeling was that of gradually becoming cold, as in frosty weather, just as when the hands go numb, but there was no actual pain. Felt pressure when the scissors went into the tumour, and experienced a kind of jar, but did not feel anything like an incision, and, in fact, was not aware when the incisions were made. Felt nothing of the next part of the operation, but when the tumour was held up and divided by three long cuts, experienced a feeling, not of pain,

but as if the parts were put on the stretch or dragged; did not feel the tying of the ligature, but when some small substance (a bit of loose fatty tissue) was cut off felt again as if the parts were being stretched. When the sutures were introduced felt the pressure whilst the flaps were being held together, but was unconscious of the prick of the needle."

In all respects this operation was, as an operation, completely successful, and one other success followed it Dr. R. did not expect. As the recovery from the excision progressed the irregular action of the heart became less marked, and ultimately disappeared altogether. In the month of July this lady called upon me, and was found to be restored to perfect health.

Soon after the recovery of the above-named patient another lady came under Dr. R.'s care, with a scirrhus tumour in her breast. In this case again the question of the administration of chloroform or of some other anæsthetic vapour pressed for careful consideration. The patient had been declared by one of her medical friends to be suffering from disease of the heart, and had been urged by him in the most forcible terms not to subject herself to general anæsthesia. Another medical friend, in less determinate but still serious expression of opinion, gave her similar advice. She herself had read of the danger she heard described, and her anxious dread alone was all but sufficient to preclude the administration of any narcotic vapour. On examination of the heart Dr. R. found exceeding feebleness of action, an irregular and often intermittent beat, and at the apex a soft systolic murmur. Under these circumstances Dr. R. advised the removal of the tumour under ether spray, which he did on the 23d of June. The steps of the operation were the same as in the preceding case.

"This patient, like the last, bore the operation perfectly. She felt no pain from the incisions, and although the deep dissection which was required to remove the tumour from its attachment was felt as a severe drag or pull, it gave rise to no evidence of acute pain. The act of sponging the wound, and the insertion of one of the sutures, caused momentary expression of pain, but on the whole, she was throughout brave, perfectly collected, and as quiet as if she had been asleep. This patient, like the previous one, progressed so favourably that she was allowed to get up every day. On the fourth day after the operation, as she complained of the pressure of the pad, I removed the dressing, and found the wound freshly healed throughout its entire length, without a trace of supuration. In this act, however, a little misfortune occurred. A portion of the cotton wool adhered firmly, through the styptic colloid, to a loose end of the upper suture, and, while I was extricating the wool, an accidental movement of the patient caused the ligature to tear out of the upper lip of the newly-joined skin. From this slight point there flowed as much as a drachm and a half to two drachms of bright-red very thin blood. I stopped this bleeding, not very readily, by firm pressure with styptic wool; but a little further bleeding took place during the day beneath the compress and into the subcutaneous tissue, and gave rise to a superficial sore about the size of a sixpence. On the eighth day after the operation the patient was able to go out of doors, and, but for the slow healing of the small sore whence the hemorrhage proceeded at the first dressing of the wound, recovery rapidly succeeded.

"One other fact closely connecting this with the preceding case is worthy of particular notice. As this second patient began to rally from the operation, the distressing cardiac symptoms entirely passed away, the stroke of the heart improved in tone, the irritability ceased, and the faint murmur became imperceptible."

Dr. R. makes some interesting comments on the facts above recorded.

"1. *As to the effect of the local anæsthesia.*—This in both the cases afforded everything that could be desired in the way of anæsthesia. It saved all acute pain; it saved the patient the dread of death during the insensibility from a general anæsthetic, and it enabled me to proceed in our task without a thought as to the immediate safety of the patient. I may say more for it still. It warranted me in recommending the operation. I should certainly not have advised any friend of mine, whose heart was in the same condition of irritability and irregular nervous supply, to inhale an anæsthetic vapour to the fatal effects of which such conditions of the circulation are so favourable.

"2. *The method of cutting with scissors.*—Local anæsthesia has many disadvantages. It is more troublesome than general anæsthesia as a detail of practice, and, as it leaves the consciousness alive, it fails at times in preventing the fears of the patient. But hitherto the greatest difficulty in operating under it has been the obstacle of cutting through the hard, frozen, insensible part. The resistance to incision by the best cutting knife, and especially to dissection by the knife, is such that I have seen the most skilful surgeons troubled by it; and I have never been able to complain of the objection that has been made to the method, on this ground. The difficulty is now overcome by the process of scissor-cutting which I have here introduced. The advantage of the scissors over the scalpel will be at once proved by anyone who will take a thick, firm structure—the cover of a book for example—and try to cut through it. With the best of scalpels he will be troubled; but with scissor blades he will cut with the utmost facility, if the blades be well set. So, in cutting through the frozen animal tissue, the parts can be divided as rapidly as may be wished with the scissor blades, with perfect accuracy of incision, and as deeply as may be desired. The cutting is also made without any downward pressure, by which pain of pressure is saved. Also in deep dissection, the tissues, frozen as they are exposed, can be divided more easily than by the knife; for the harder they are solidified, the easier they are divided by the scissor blades. In a word, I believe that every cutting operation, in which local anæsthesia is practicable, may be performed neatly and effectively by scissor-cutting, and that a much larger number of operations may now be painlessly carried out under the local method.

"Some little attention requires to be paid to the instruments used. The scissors for superficial or skin cutting should be exquisitely sharp, neat, and strong; and I prefer them slightly curved. For deep cutting, where there are many bloodvessels, the tooth-edged cutters are valuable. These pierce, crush, and divide at the same time, and they save blood. For other purposes, as for division of a sinus, some modifications are required, and Messrs. Krohne and Senseman are now making for me a case of instruments for the special purpose of operation on the method under consideration.

"3. *The effect of the operation on the heart* I consider as extremely instructive. In both instances the cardiac irregularity and irritability were purely due to irregular nervous supply—to nervous irritation and consequent muscular exhaustion. The irritation might have been in part due to the mental anxiety which naturally accompanies the disease, or it might have been due to the irritation of the tumour, and have been reflex in character. Whichever view be correct, the result of the operation was curative, and, as the cases are typical of a class of phenomena of disease, the lesson they teach is extended far beyond them as individual illustrations. They show that so soon as the heart obtains rest from the persistent nervous thrill that invades it, its muscular tone returns, and its irregular motion and excitability cease. Thus by operating early for the removal of cancer the surgeon acts as physician also, and prolongs the general life by removing the local disease. I am convinced I have seen patients suffering of cancer die from the mental and local irritation of the disease long before any development of the malady has advanced to kill by destruction of the part or organ involved. I infer, therefore, that if, without any danger to life from general anæsthesia, we can remove external malignant growths painlessly and promptly, so soon indeed as they are detected, we shall bring art, effectively, to the defeat even of cancer."

40. *Superiority of Immobility to Resection of the Hip-joint in Suppurating Coxalæ; Disadvantages of Resection; Rarity of the Indication for it.*—This is the title of a paper read by M. VIENNOIS before the French Association for the Advancement of Science at its recent meeting. His conclusions, drawn from twelve cases in his own practice and from a certain number in the practice of Dr. Ollier, are that in most cases immobility by the silicated bandage and careful attention suffice to effect a cure.

This surgical maxim was supported by MM. Giraldez, Verneuil, and Ollier, who admitted the infrequency of reasonable indications for coxo-femoral resection.—*Gazette Hebdom.*, 28 August, 1874.

41. *Traumatic Tetanus successfully treated by Chloral and Morphia.*—M. BOURDY, of Mans, reported to the Surgical Society of Paris, a case of this. The subject of it was a man, æt. 29, who had received a wound of his head from a fall, January 27. Tetanus manifested itself thirty-six hours afterwards by rigidity of the muscles of the neck, and 8 grammes of chloral were given, which produced some benefit. On the 2d and 3d of February, the tetanic symptoms became worse; there was opisthotonos; 8 gr. of chloral were given and subcutaneous injections of morphia. This treatment was continued until the 15th of February, when the morphia was discontinued, but the chloral was continued. From the 19th to the 25th, the tetanus progressively diminished and gradually yielded to the chloral. During the duration of the disease the patient took 228 grammes of chloral, and gr. 1.82 of morphia, by subcutaneous injections or by the mouth. Dr. B. recommends the association of morphia with chloral in the treatment of tetanus.—*Journ. Hebdom.*, 19 June, 1874.

42. *Excision of the Scapula and nearly the entire Clavicle for Malignant Disease.*—Mr. C. S. JEAFFRESON, Surgeon to the Children's Hospital, Newcastle-on-Tyne, reports (*Lancet*, May 30, 1874) the following interesting case:—

“Miss S., a fair-complexioned, healthy young lady, twenty years of age, first consulted me in the commencement of July last. She complained of pain and swelling in the neighbourhood of the left shoulder-joint. Occupying the upper part of the left humerus was a large, somewhat ill-defined, swelling; it was deeply seated, and evidently underlying the various muscles which cover the upper part of that bone. At this time, at its largest portion, it measured in circumference twelve inches. There was little difficulty in diagnosing it to be a malignant growth from the bone; and, on inquiring into her family history, I discovered that her mother had died when about forty years old of uterine cancer.

“At this period amputation at the shoulder-joint was strongly urged upon my patient, but she would not consent. In the course of a few weeks the swelling rapidly enlarged, and the bone gave way in its centre. For a short period I now lost sight of my patient, who, in despair, had placed herself under the care of a bone-setter. The treatment she received at his hands did not tend to ameliorate matters, and, at the commencement of August, when she returned to me, the circumference of the humerus at its largest part was sixteen inches and a half. The swelling had spread upwards. Large veins ramified upon its surface, and it presented exactly the appearance of a case depicted in vol. ii., p. 108, of Mr. Erichsen's *System of Surgery*. Amputation was now performed at the shoulder-joint by means of a skin flap from the region of the deltoid. The stump healed rapidly, and for some few weeks there was no appearance of return of the disease.

“On examining the growth which was removed, it was found to be a large encephaloma surrounding the upper part of the shaft of the humerus. It had evidently grown under the periosteum, and the bone had given way in its centre. There was no enlargement or expansion of the fractured extremities, but they lay free in a cavity full of extravasated blood and broken-down encephaloid matter. No spiculæ of bone were detected in the substance of the new growth.

“In December I again saw Miss S.—. At this period the whole of the stump was enlarged, and small fungating masses protruded from some portions of the old wound. But the chief indication of disease was a large swelling occupying the pectoral region. This swelling, which grew beneath the pectoral muscles, was of bony hardness, and firmly connected with the scapula and apparently the outer portion of the clavicle. When the scapula was put in action it moved freely in conjunction with it, and the skin over it was still fairly movable. There was no tenderness, but it was the seat of most excruciating pain, which radiated in the direction of what felt to her to be the arm and fingers. It was now obvious that nothing short of removal of the whole scapula and clavicle would be of any service.

“On the 14th of December, I performed the following operation: The patient, being fully anesthetized, was placed upon her right side. An incision was made from the top of the acromion, passing a little above the spine of the

scapula to within an inch of the central line of the back. A second incision was then made from the lower part of the axilla, passing obliquely downwards to the central line of the back, corresponding nearly to the upper margin of the latissimus dorsi muscle. These two incisions were joined at their distal extremities by a perpendicular one, and thus the whole mass of integument covering the scapula was reflected. All bleeding vessels were carefully tied, and the patient placed upon her back. The second stage of the operation now commenced. An incision was made, commencing at the tip of the acromion, passing along the whole length of the clavicle, and ending at its sternal articulation. The clavicle was carefully freed of all its coverings, a flat director passed under it somewhat to the inner side of its middle, and upon this it was sawn across with a hand-saw; the inner fragment was seized with bone-forceps, and about an inch removed. With a silver knife the structures surrounding the subclavian vessels were freed, and the vessels so exposed that they could readily be grasped by an assistant. The third stage was now entered upon. The patient was again turned upon her side, the muscles rapidly detached from the scapula, and the skin detached from the lower triangles of the neck. The deeper attachments of the scapula and tumour were quickly divided, commencing at the lower angle, and gradually passing upwards. Finally, an incision was made, commencing at the junction of the inner with the middle third of the clavicle, and passing downwards and outwards to join the one which passed along the upper edge of the latissimus dorsi, and the whole mass was detached.

"The vessels were so perfectly controlled, owing to the previous division of the clavicle and the removal of a portion from its centre, that but comparatively little blood was lost; nevertheless, the evidences of shock were very great, and at the moment of detachment of the mass, death seemed imminent. In a short time, however, the patient revived.

"The flaps, when brought together, fitted very accurately, and were retained in position by eighteen points of suture, and in all seven ligatures were employed.

"It will be unnecessary to give a detailed account of the progress of the case. A great portion of the wound healed by the first intention. The patient was able to leave her room in less than a month.¹

"The length of the combined incisions measured in all about three feet.

"An examination of the parts removed proved of great interest. The bulk of the growth consisted of two oval masses of dense ivory-like bone, which, though in close apposition to each other, were not connected. Growing deeply in the angle between the inner surface of the scapula and the ribs, these masses had no absolute connection with any of the bones, although they had contracted extensive adhesions to the periosteum of the scapula. From their form I believed them to be ossified lymphatic glands, such as are occasionally met with in cases of osteoid cancer. The base of the stump was infiltrated with firmish encephaloid matter."²

43. *Ligature of the External Iliac in Elephantiasis.*—At the recent meeting of the Congress of German Surgeons, Professor HUETER, of Greifswald, exhibited a patient in whom he had in 1870 tied the external iliac for elephantiasis, which had in a very marked degree followed ulcer of the leg and repeated attacks of erysipelas of the extremity. The effect of the operation was very satisfactory, but about a year after its execution, amputation of the leg had to be performed on account of extensive and intractable ulceration. At the time of the amputation not the slightest vestige of the elephantiasis remained, nor has this recurred, although, when the ligature was tied four years ago, it extended as far as the inguinal region. Professor Hueter has operated four times, meeting as he does with a great number of these cases, the disease seeming to be

¹ Since writing the above paper, I regret to state, the disease has again recurred, but in a very slow form, and the girl is still enjoying good health.

² Dr. Jeaffreson appends to his paper a table of six similar operations performed respectively, Cumming, in 1808, Mussey, in 1837, Rigaud, in 1842, Fergusson, in 1874, McClellan, in 1838, and Syme, in 1863.

endemic in Mecklenburgh, Pomerania, and West Prussia. Three of the cases recovered, and one terminated fatally, the patient becoming the subject of delirium tremens, and dying with the septic process set up near the site of the ligature. Another patient exhibited was a woman, upon whom the ligature had been applied five years before for an elephantiasis, accompanied by so horribly stinking a discharge as to render her existence in society a nuisance. The limb is now very nearly in a normal condition, and she is able to go about her household affairs. The first patient alluded to has been obliged also to submit to the removal of a testis on account of caseous disease of it; so that he has undergone three operations, and yet is quite well, and even—at all events, temporarily—cured of a marked propensity for drinking. It is to be remarked that at the amputation of his leg the bleeding from the tibial arteries was so slight that there was great difficulty in detecting their orifices at the surface of the stump, and tying them was scarcely necessary.

Professor Bryk, of Cracow, observed that he had tied the femoral artery immediately under Poupart's ligament in three cases. The first was a peasant woman, twenty-nine years of age, in whom the elephantiasis was complicated by an ulcer of the leg. After the ligature the swelling was much reduced, and the ulcer cicatrized. In less than a year, however, amputation of the leg had to be performed, partly on account of a recurrence of the tumour, and partly because of an obstinate spreading of the ulcer. The patient did well, and is still living. A young woman, aged twenty, had a relapse some months after the ligature, and having undergone amputation of the leg on account of the dreadful pain in the foot that accompanied the swelling, died of pyæmia. The third patient, a blacksmith aged thirty, found, ten months after the operation, that the tumour was recurring, but by aid of a flannel roller he has been enabled to prevent its reaching its former size.

Professor Bardeleben observed that he found the disease as frequent in Berlin as in Pomerania. The patients, however, are very unwilling to be operated upon. He prefers compression, either digital or by means of a compressor, as a much less dangerous procedure than ligature of the iliac or femoral, and by its means he has treated two cases with apparent success. One of these he has seen three years after leaving the hospital, and then the disease had not reappeared, but ulceration had broken out in the leg.—*Med. Times and Gaz.*, July 4, 1874.

44. *Treatment of Gluteal Aneurism.*—MR. TIMOTHY HOLMES, in a lecture on gluteal aneurism, delivered before the Royal College of Surgeons (*Med. Times and Gaz.*, June 13, 1874), thus summarized the treatment:—

1. When either traumatic or spontaneous, rapid or gradual compression applied to the aorta or common iliac should be tried.
2. If this treatment does not succeed by itself, it should be supplemented by coagulating injections or galvano-puncture during anæstheticism and compression.
3. When such treatment fails, either the internal iliac must be tied in one set of cases, or the old operation or Anel's ligature resorted to in another set as pointed out above.
4. The ligature of the internal iliac is liable to failure in cases of spontaneous aneurism from a diseased condition of the coats of the artery, and should always be avoided when other means of treatment are available.

45. *Surgical Treatment of Inguinal and Femoral Aneurism.*—MR. TIMOTHY HOLMES, in his third lecture before the Royal College of Surgeons of England (*Brit. Med. Journ.*, July 4, 1874), presented the following *résumé* of his views:—

1. The operation of ligature of the external iliac artery has been, on the whole, fairly successful, as evidenced by a very small mortality in uncomplicated cases of hemorrhage, and a mortality of about one-fourth in published cases of aneurism—a conclusion supported by the unpublished records of hospital practice, though a few cases of recurrence of the aneurism have occurred.

2. The operation on the superficial femoral for aneurism situated in Hunter's canal is a very successful operation.

3. The ligature of the common femoral is a perfectly justifiable proceeding, though whether it be more or less trustworthy than that of the external iliac artery, we are not as yet in a position to judge.

4. Ruptured aneurism in the thigh has been treated with a large amount of success by the old operation.

5. Ilio-femoral and femoral aneurisms have been treated with a very fair proportion of cures in the few instances on record by rapid compression applied to the aorta or to the common iliac; but there is no evidence to show that this treatment is less dangerous or more successful than the operation on the external iliac artery, when the latter is feasible.

6. Compression, especially digital pressure, has been applied to the treatment of inguinal and femoral aneurism with striking success, though in what proportion of cases we do not as yet know; and the comparative ill-success of this method in our hospital-practice is more calculated to raise doubts of the efficiency of the application than of the soundness of the method itself.

7. In rare cases, direct pressure, or even manipulation may be advantageous.

8. Arterio-venous femoral aneurism should be treated by double compression, applied to the vein and artery, which failing, Mr. Spencer's method of tying the artery above and below is the most hopeful measure, and, when this is impracticable, either the old operation should be performed, or the case abandoned.

9. Spontaneous aneurisms of the profunda have been diagnosed and successfully treated by compression.

10. Recent traumatic aneurisms of branches of the external iliac or femoral are best treated as wounds of these vessels—*i. e.*, either by compression or by ligature at the wounded point.

46. *Treatment of Popliteal Aneurism.*—Mr. TIMOTHY HOLMES, in a lecture on popliteal aneurism, delivered before the Royal College of Surgeons (*Brit. Med. Journ.*, Aug. 8, 1874), gave the following as the conclusions as to the treatment of popliteal aneurism to which our present experience points.

1. Rapidly growing aneurisms, with a thin or imperfect sac, are best treated by immediate ligature, especially when caused by recent violence; and the success of compression is doubtful in aneurisms growing towards the knee-joint, and in all others which advance rapidly.

2. The Hunterian ligature has been about twice as successful in modern hospital practice in this country, as the results of the accepted statistics show it to have been.

3. The results of the compression treatment in the same hospitals have given as yet about the same average results as those of the ligature, but these results might be much improved by a more careful employment of the method.

4. Too long persistence in compression is to be deprecated, as being likely to interfere with the success of the ligature.

5. Flexion is often successful when used so as not to distress the patient, and is worthy of a trial in all cases in which it stops or materially checks the pulsation, but should not be long persisted in when it is not at once beneficial.

6. We have no evidence showing the utility of or the need for the less usual forms of treatment, such as galvanism, coagulating injections, manipulation, temporary ligature, or the introduction of foreign bodies.

47. *Treatment of Hemorrhoids by the Injection of the Tincture of Chloride of Iron.*—Dr. WM. COLLES, surgeon to Steeven's Hospital, considers hemorrhoids as a vascular growth resembling nævus in children, or erectile tissue in adults. Under this view he recommends (*Dublin Journ. Med. Sci.*, June, 1874) the treating them as we do nævus by the hypodermic injection of the chloride of iron to excite a certain amount of inflammation, and secure the coagulation of the blood in the minute vessels composing the growth, and their subsequent absorption. He relates a case in which he practised this plan with success. The piles being forced down, about twenty minims of the ordinary tincture of the chloride of iron was injected by means of an hypodermic syringe into each hemorrhoidal tumour. This caused but little pain. 2. Four weeks afterwards the section was examined by means of a speculum, and no trace of the piles could be discovered, except three nodules of cuticle, each the size of a shrivelled currant.

48. *Removal of Tumour from the Bladder.*—Dr. SCHWAIGHOFER gives (*Irish Hospital Gazette*, July 15th) the following account of an operation recently performed by Prof. BILLROTH for the removal of a tumour from the bladder of a boy twelve years of age. "Until ten months ago, he had been very healthy, but then began to complain of pain in passing water. He experienced it both in the glans penis and in the region of the bladder, but it was not very severe. The urine soon became cloudy, and the desire to pass water used to come on so suddenly, that the boy would not have time to reach a urinal. The medical man, under whose care the patient was in the country, diagnosed a urinary calculus, and the parents accordingly brought him to Vienna for operation. He was tolerably well nourished, rather pale, and well grown for his age. On examination with the sound, the bladder could be reached without difficulty, and when there the instrument glided over a rough surface. On percussion, however, no hard body could be discovered. The pain caused by the examination was not very severe. In consequence of the urine being usually passed in bed, from the sudden necessity which he could not control, it was only with difficulty that small quantities of it could be collected. It was very cloudy, had a weak, acid reaction, contained a considerable amount of albumen, and, after having stood for some hours, it formed a sediment at the bottom of the vessel, consisting principally of mucus and pus. When a distension of the abdomen, caused by constipation, which lasted for several days, had subsided, a tumour in the region of the bladder could be distinctly felt through the abdominal walls. It was slightly painful upon pressure. It could also be felt upon examination per rectum; its consistence was very much that of a fibroma, and it seemed to spring from the bladder. Further examination showed that the walls of the bladder were greatly hypertrophied; the sound, however, came in contact with no hard body within the bladder. A combined examination with the sound and per rectum, confirmed the opinion that the tumour was in connection with the bladder. This last examination gave considerable pain, and was followed by slight hemorrhage. The patient was very feverish for some days. When the fever had abated, Billroth undertook the operation. There was little doubt but that a tumour was present within the bladder; however, as there might also be a calculus contained in a diverticulum of the mucous lining of the bladder, Billroth determined, in the first instance, to perform a lateral lithotomy, and then, if his supposition was confirmed, and the tumour was adherent to the bladder, to make the high operation and so remove the growth. The lateral incision was made in the usual way. Upon passing the finger into the bladder, a tumour, the size of an apple, could be easily felt growing from the posterior wall of the bladder, but its pedicle could not be found. The high operation over the symphysis pubis was at once performed. It was with some difficulty that an opening could be made in the bladder in this place, without wounding the peritoneum, in consequence of the organ having contracted when the urine flowed off; but, in the end, the object was successfully effected, although the peritoneum was extensively exposed. The tumour grew with a short and tolerably broad pedicle from the posterior wall of the bladder, and very high up, as could be distinctly felt by fingers passed simultaneously through each wound. Notwithstanding an enlargement of the upper wound which was made, the opening proved still too small for the removal of the tumour through it, and Billroth then tried to break up the growth with his fingers. At first he only succeeded in breaking off small portions of the rather soft tumour, but finally he tore off the entire tumour from its pedicle, and compressing it somewhat at its centre, was able to remove it through the upper wound. It was now easy to draw out through the same aperture, that portion of the wall of the bladder upon which the tumour had been situated, so that the short pedicle of the latter, about two centimetres broad, became visible. This was then dissected off from the bladder, and, in order to do so effectually, it was necessary to go deep into the muscular layers of the wall, so that the peritoneum was again in danger of being wounded. This was fortunately avoided. Two small arteries had to be secured, and the ends of the ligatures were drawn out through the lower wound. In this manner the tumour had now been thoroughly removed. The wounds remained open, and for the purpose of allow-

ing the urine to flow off easily, a drainage tube was passed through from the upper to the lower wound, and let lie. Since the operation the patient feels relatively well, having fevered but slightly. The wounds look remarkably well, notwithstanding the contusion which they must have suffered during the operation. Microscopical sections made from every part of the tumour showed beyond controversy that it was a pure myoma. Both on account of its pathological rarity, and of the ingenious boldness of the operation, the case is one which I imagine will be of general interest."

49. *Billroth's Case of Extirpation of the Larynx and Epiglottis.*—The patient upon whom Billroth extirpated the larynx for the removal of carcinomatous growths of that part (see No. of this Journal for April, p. 556) and for whom a very ingenious vocal apparatus was afterwards contrived (see No. of this Journal for July, p. 268) suffered from a return of the disease soon after his return home which proved fatal on the 7th July last, a little over six months after the operation.

OPHTHALMOLOGY.

50. *Treatment of Exophthalmic Goitre with Belladonna.*—Dr. R. T. SMITH relates (*Lancet*, June 27, 1874) two cases of exophthalmic goitre in which, after trying for months without success the various remedies advised for this affection, he was induced to try in the first case belladonna, as a mere experiment, on two grounds: first, that the disease is considered by some to be essentially a paralysis of the cervical sympathetic; secondly, the statements of Dr. John Harley and Dr. Meryon, that belladonna is a stimulant of the sympathetic. Five minims of the tincture were given every hour. Compared with previous treatment the effect was surprising. In two days the pulse was 90, the palpitation very materially relieved, and the outbursts of perspiration very much subdued. In four days the pulse was 80, and on the fifth day the patient walked from King's Cross to Paddington and back again. For ten days no other drug was given, and it had once to be suspended owing to an intercurrent attack of diarrhoea. The dose was then reduced to fifteen minims four times a day; subsequently iron was added.

The relief of the palpitation, of the quick, throbbing pulse, and of the profuse perspiration was, so to speak, immediate. The patient was restored to comfort and ease in a fortnight. Amelioration in other respects was gradual, and is still progressing. The diplopia was removed in six weeks. It was quite two months before decided improvement in the exophthalmos could be reported.

In the second case, for three months he tried in succession, iron, digitalis, valerianate of zinc, ice to the neck, aconite, iodine internally, and the constant current, with very little if any relief. In July I began the use of belladonna, giving five minims of the tincture every hour. The effect in relieving the palpitation, reducing the frequency of the pulse, and in subduing the "flushings" and perspirations, was quite as manifest as before; but meanwhile other symptoms had appeared—namely, severe headache, occasionally followed and relieved by copious epistaxis, and attacks of angina, which were on two or three occasions so severe as to require the administration of chloroform. Belladonna alone quickly relieved all these symptoms, and in a month's time she might fairly be considered cured. The muddiness of the complexion was gone, and her natural expression was restored; the pulse was 70, and the palpitation removed. But the thyroid gland has undergone little reduction, and has become firm and hard by a fibroid change.

It is a rather interesting fact that in both patients there was a considerable development of fat after the relief given by belladonna. In both cases there have been some recurrences of the symptoms, but they have speedily given way on resuming the treatment. The drug was not given during sleep, and it is noteworthy that reduced doses sufficed as the treatment was continued.

Harley states that moderate doses cause contraction, large doses dilatation of the arteries; and it is therefore of great importance that the varying susceptibility of individuals in reference to this drug be kept in mind.

But as there are cases of palpitation quite unassociated with exophthalmos and enlargement of the thyroid, which are greatly benefited by belladonna, it is possible that in the above two cases the relief given was primarily through the heart, the drug acting sedatively thereon.

51. *Removal of Opacity of the Vitreous Body by the Electrical Current.*—M. LE FORT, in a paper read at the Académie de Médecine on July 7 (reported at length in the *Gazette des Hôpitaux* of the 9th), described the success which, in two cases of blindness due to opacity of the vitreous body, had attended the permanent application of feeble continuous electrical currents. One of these occurred in 1872, and the other in 1874, sight being recovered in both in five or six weeks by the use of a current derived from only two pairs of elements, applied at first permanently, and afterwards only at night. These cases have occurred during a series of investigations he has been engaged in for the past two or three years, having for their object the substitution of the continuous current, feeble in degree, but permanent in operation, for energetic and temporary currents in the treatment of paralyses, muscular contractions, and lesions of nutrition. Encouraged by the success of these cases, he is now trying this therapeutical procedure in other lesions of nutrition, such as cataract, atrophy of the papilla, etc.; but his observations are as yet too recent to warrant more than directing attention to the subject. He believes, however, that this substitution is indicated in paralysis with atrophy, and wherever we desire to exert a continuous action on the functions of an organ.—*Med. Times and Gaz.*, July 18, 1874.

52. *Results of Cataract Operations.*—DR. ALBERT MOOREN gives, as the result of 1500 operations by Von Graefe's method, 6 to 6½ per cent. of loss. In thirteen of these cases he performed iridectomy with the purpose of creating conditions which would remove any danger arising from the artificial hastening of the maturity of an unripe cataract. Every case succeeded, and three of them had both eyes operated on. The method of procedure was as follows: From eighteen to twenty-one days after an iridectomy had been made, the coloboma of the iris having been dilated by atropia, the lens-capsule was opened by a dissection-needle in about three-fourths of its circumference. Great care was taken not to hurt the iris in any way, and disturbance of the lens-substance was avoided as much as possible, so as to obtain a homogeneous and perfect cataractous formation, which is not so apt to cause irritation of the uveal tract as when the lens is unequally hardened. After the full reaccumulation of the aqueous humour, instillation of atropia was resorted to, and the pupil kept under the influence of it till the extraction, which was performed in from eight to twenty-one days, according to the arrival of the cataract at maturity. He says it is particularly applicable to posterior polar cataract.—*London Med. Record*, July 22, 1874.

53. *Bader's Operation for Conical Cornea.*—DR. CHARLES BELL TAYLOR reports (*Lancet*, June 20, 1874) eight cases operated on by him by this method, which consists: first, in shaving off the apex of the cone and suturing the wound, and second, by simply opening the anterior chamber by means of the removal of a minute flap, and leaving the wound to heal without any further interference. The results in these cases were most satisfactory. In only one was any trouble occasioned by the operation, and this he suspects was due to the excision of too large a flap of the cornea. The operation he admits requires considerable dexterity. He has seen no reason, so far as his experience goes, to dread extensive adhesions of the iris, if the operation is carefully performed and atropia employed afterwards; while the corneal scar is so slight that he has not in any of his cases found it necessary to tint the cornea for cosmetic defect.

54. *On the Ophthalmoscopic Appearances of the Optic Nerve in Cases of Cerebral Tumour.*—In a paper on this subject in the *Dublin Journal of Medical Science*, June, Dr. FITZGERALD relates a case of *Stauungs-papilla*, and gives a short *résumé* of the theories which have been put forward to account for this congested condition of the disk in cases of cerebral tumour. He particularly desires to correct what he considers a widely-spread but erroneous impression, "that Von Graefe regarded the *Stauungs-papilla* as absolutely diagnostic of the presence of a cerebral tumour," and points out that Graefe looked upon this condition of the disk as "merely the expression of increased intra-cranial pressure." Dr. Fitzgerald concludes his paper by insisting that, though the appearances of the disk in *Stauungs-papilla* cannot be looked upon of themselves as of any special diagnostic value, those appearances, combined with a careful study of all the symptoms in any particular case, must prove of invaluable assistance in forming a diagnosis.—*London Med. Record*, July 1, 1874.

55. *Extraction of a Piece of Steel from the Vitreous Humour by the Magnet; Recovery with almost Perfect Vision.*—A most extraordinary case of this is recorded (*Brit. Med. Journ.*, June 20, 1874) by Dr. Wm. A. McKEON, Surgeon to the Ulster Eye Hospital. A boy, æt. 15, while striking a rivet was struck by a fragment from the hammer in the corner of the right eye. The sphincter of the pupil was cut at the outer margin, and the iris at that part towards its peripheral attachment. The boy could count fingers easily. The ophthalmoscope showed no trace of opacity of the lens; and the fundus of the eye could be seen distinctly, except a small part at the temporal side. Deep in the vitreous body at that part were observed, by direct illumination, opacities situate near to the retina, and showing a marked tendency to a dependent position, as if somebody were pulling them down. Sometimes, at the lower part of one of the opacities, a silvery streak appeared, as if from the sharp margin of a bright metallic body. On throwing the light obliquely from the mirror held to the left of the middle line of the patient, and placing my eye in such a position as to receive the rays reflected from the opacities, they appeared red, with a very lustrous aspect, as if some bright reflecting substance were imbedded; whilst the margin before referred to could also be recognized. To all present at the examination, the evidence of the presence of a foreign body, masked by a slight effusion of blood in the vitreous, was convincing. The metal had taken an extraordinary course, as, after penetrating near the centre of the cornea, wounding the iris, and passing behind it, it turned round the margin of the lens, apparently without wounding it, and entered the vitreous body.

The next day the patient suffered great pain, and the media of the eye had become so cloudy the foreign body could no longer be detected. After full consideration as to the best method of procedure, Dr. McK. obtained a magnet about eight inches long, one inch broad, and one line thick, and tapering at both extremities to a blunt point.

"The patient having been etherized, I made an incision about two and a half lines in length in the sclerotic at the outer part, about two and a half lines from, and parallel to, the corneal margin. A pair of iridectomy-forceps were introduced into the vitreous humour, but they failed to touch the body. I then tried the magnet. I introduced the pointed end into the vitreous humour as far as its shape would admit, and directed it backwards towards the posterior pole of the eye. The foreign body was felt to become detached; but it was only on the third trial that I had the satisfaction of withdrawing the metal on the end of the magnet. It was oval in shape, about a line long, and half a line broad, sharp on the edge, particularly on one side. The thickest part was about a quarter of a line. It weighed half a grain.

"Although the magnet seemed a clumsy instrument to thrust into the eye, yet it answered the purpose admirably—it fulfilled the important indication of perfectly preventing loss of vitreous humour during the operation. The foreign body was twice removed from the magnet by the grasp of the margins of the sclerotic wound. For this reason, it would be an advantage to have on each side of the end of the magnet a little slide, which could be pushed down about

a line past the extremity of the magnet, so as effectually to shield the foreign body from contact with the edges of the wound at the time of withdrawing the instrument from the eye.

"The vitreous body, whilst it retains its structure, offers great resistance to the passage of a foreign substance through it by magnetic attraction. Suppose a piece of metal to be under the influence of the magnet, and that the vitreous body between the substance and the magnet be sound, the most powerful magnet will not draw the foreign body through the vitreous humour; but the vitreous humour, if there be space to move in, will move in mass with the body, and attempt at extraction will fail. Hence it is necessary that the vitreous humour intervening should be broken up, so as to make a passage whereby the metal may pass. The knife by which the incision is made should be used for this purpose, or even the end of the magnet itself.

"The boy remained in hospital three days, and was subsequently treated as an extern patient. The treatment consisted in the instillation of a solution of atropia and the application of the compress bandage. No pain was felt after the operation; the media of the eye cleared rapidly; and the vision improved from day to day. In a short time, the wound in the cornea was scarcely perceptible; the iris, where it was cut and bruised, seemed to atrophy, the rest of it remaining healthy; the lens retained its transparency; the vitreous body showed some slight filmy opacity where the foreign body had been lodged. The field of vision was perfect, save the small part to the nasal side corresponding to the part of the retina in the neighbourhood of the wound.

"On the 13th of December last, I brought the patient before the members of the Ulster Medical Society, when we found the state of matters above described. I tested his vision, and found that he could read No. 2 of Snellen's types at one foot—a degree of acuity extremely satisfactory. In fact, the boy notices very little difference between his eyes. He resumed his work soon afterwards, and has continued well ever since."

MIDWIFERY AND GYNÆCOLOGY.

56. *Induction of Premature Labour.*—Dr. J. G. SWAYNE reports (*Brit. Med. Journ.*, Aug. 8, 1874) twenty cases in which he induced premature labour. From the statistics of these cases, it appears that of the twenty cases in which the operation was performed, seventeen were multiparæ, and three primiparæ. In one case the operation was performed three times in the same individual, and in three, twice. With regard to the morbid condition which rendered the operation necessary, we find that, in the greater number of cases, viz., fourteen out of twenty, it was deformity of the pelvis. The subjects of this deformity were all of them multiparæ. In the remaining six cases, the operation was rendered necessary in three by obstinate vomiting, and in three by albuminuria. Of the first three, two were primiparæ. Of the last three, two were multiparæ. In one of these, the albuminuria was complicated with jaundice.

With respect to the period when the operation was performed, we find that, in by far the greater number, viz., sixteen out of twenty, it was during the eighth month of pregnancy. Of the remaining four, in one it was during the ninth month, in two during the seventh, and in one during the fourth month. In these last three, when it was necessary to operate before the fœtus was viable, great deformity was the cause in the first two, and obstinate vomiting in the last.

The great utility of the operation as an alternative for craniotomy in cases of deformed pelvis has been so universally recognized, that I need say no more on that head; there has, however, not been quite so general a consent as to its utility in cases of obstinate vomiting attending pregnancy, and in albuminuria causing anasarca and threatening convulsions. Of course, in cases of obstinate vomiting, the operation is only to be performed as a last resource, when all remedies have failed, and the patient is in imminent danger of starva-

tion; and this remark especially applies when the infant has not yet arrived at the age of viability. I have performed the operation three times for this cause. In two, it was attended with the happiest results, the patients being apparently snatched from the jaws of death. In another, it was unfortunately too late to save life. In all three, the patients were all but moribund.

I remember once being called to a lady, nearly six months pregnant, suffering from obstinate vomiting, whose condition appeared so desperate, that I told her husband that, if I did not find her better on the next day, I should at once bring on labour. I was again summoned to her on that night, because labour pains had set in; and she was very shortly delivered of twins. Her condition at once improved; all vomiting ceased, she speedily regained flesh and strength, and from that time made a rapid recovery. Nature thus anticipated me, and pointed out, in the most convincing manner, the proper course to be adopted in such cases.

In the three cases of albuminuria in which I had recourse to premature labour, the affection was of a very obstinate character, and attended with peculiar risk. Thus, in the first, there was much general anasarca and commencing effusion into the chest. These symptoms rapidly disappeared after delivery, and the child also was saved. The second case, however, did not end so favourably. This patient had repeatedly miscarried two or three months before the full term. In each instance, the fœtus had gradually become feeble, and its movements had ceased before it was expelled, its death apparently having been caused by a most extraordinary and abnormal development of the placenta. When I induced labour, the health of the mother had suffered very much, and her condition had become very critical. She had long suffered from obstinate vomiting, jaundice was commencing, and the urine not only contained albumen, but a considerable quantity of bile. The operation was resorted to quite as much to save her life as that of the child. Unfortunately, it was not performed sufficiently early to save either.

In the third case, in which albuminuria was the cause of the operation, the urine, when boiled, was nearly solid with albumen, and there was considerable general anasarca. The patient, during a previous labour, being in the same condition, had nearly lost her life from puerperal convulsions. On this occasion, the operation was attended with the best results as regards the mother; but the child, probably poisoned by the maternal blood, only survived six hours.

I have never had occasion to deliver prematurely in order to save the life of the child, when, without any apparent reason, the death of the fœtus has regularly taken place a few weeks before the full term. Such cases, however, have occurred to others, and the propriety of the operation has been recognized ever since the time of Denman.

The next point for consideration is the mode of performing the operation. In my first two cases before the year 1850, labour was induced by the old-fashioned methods, viz., by puncturing the membranes and giving ergot in No. 1, and by detaching the membranes around the os in No. 2. After the time mentioned, having read Sir J. Simpson's memoirs on the subject, I always commenced the operation by dilating the os uteri mechanically before puncturing the membrane—a method which is much superior, because it more exactly imitates the natural process of labor. To puncture the membranes before there is any dilatation of the os is to put the cart before the horse, and to invert the process of labour; and, therefore, it is no wonder that such a proceeding, especially when combined with the use of ergot, is more apt to endanger the life of the child from compression of the cord.

Accordingly, in all my other cases (with one exception), labour was invariably commenced by dilating the os uteri. In that, the condition of the mother was so critical, that very prompt delivery was necessary, without reference to the child, and there was already some dilatation of the os uteri.

Dr. S. prefers carbolized sponge-tents for the purpose of dilating the os uteri very much to Dr. Barnes's elastic bags, because they effect the process of dilatation more steadily, continuously, and gradually, and therefore imitate more exactly the natural process of dilatation, which frequently occupies several

days from its first commencement. As a general rule, it is not desirable to dilate the os too rapidly, especially when the time for that operation falls considerably short of the full term, for then there is a proportionally greater thickness of the os uteri to overcome.

Unless there be some special circumstances present which render prompt delivery necessary, it is never advisable to induce premature labour with that rapidity which Dr. Barnes enumerates as one of the advantages of the elastic bags, when he remarks "that it is just as feasible to make an appointment at any distance from home to carry out at one sitting the induction of labour as it is to cut for the stone." This is, no doubt, one great advantage which we can derive from the use of the elastic bags; but still it is one of which we should do well not to avail ourselves, except under very exceptional circumstances. The chief objection, I think, to the elastic bags, is the difficulty of introducing them. Unless the os uteri is tolerably low, and open enough just to admit the tips of the two fingers, it will be much safer to commence the dilatation with a tent of tangle or sponge.

The opposite extreme, of occupying too much time in the process of dilatation, is also to be avoided.

The time occupied by premature labour artificially induced, Dr. S. says, is very variable. In his cases, the shortest time was six hours, the longest sixteen days: the average three days.

As to the result of the operation to mother and child: In the twenty cases three mothers died after the operation. In two of these the condition was desperate, and in only one case was death clearly the result of the operation.

Eleven infants out of the twenty were stillborn, and of those born alive two died subsequently.

On the whole, Dr. S. remarks, as regards the maternal mortality the induction of premature labour has not, in my hands, shown a more favourable result than the operation for which it is an alternative—viz., craniotomy, which in my own practice has proved fatal in two cases only out of thirty-four. In three of my twenty cases, the induction of labour gave rise to very severe and alarming symptoms resulting from shock, such as excessive rigors, pain in the back, with abdominal tenderness, and a pulse of 130; so that I cannot altogether endorse the statement of Dr. Churchill, when he says that "there is unquestionably *some risk* incurred by the mother, but not more than by an accidental premature labour."

Although the saving of infant life effected by this operation is an advantage which far outweighs any of the disadvantages just mentioned, yet the accoucheur should, I think, always bear in mind that it is a proceeding attended with some risk, and involving a great amount of responsibility—such an amount, indeed, that he ought always, if possible, to share it with another practitioner.

57. *Puerperal Convulsions*.—Dr. THOMAS MOORE MADDEN read an interesting paper on this subject before the Dublin Obstetrical Society (May 9, 1874). He discussed the etiology of the disease, its classification, symptoms, and treatment.

With regard to the latter he states (*Dublin Journ. Med. Sci.*, June, 1874) that it must be considered in reference to the state of the patient in each instance.

In all cases prevention is better than cure, and hence the importance of an early recognition of the premonitory symptoms, as by timely prophylactic measures we may sometimes succeed in warding off impending convulsions.

In this prophylactic treatment our objects are—first, to relieve the kidneys; secondly, to assist the efforts of nature to purify the blood; and, thirdly, to soothe the nervous irritability peculiar to these cases. The first object may be attempted by cupping and fomentations over the loins, the free use of diluents, and the cautious administration of mild diuretics, and especially by colchicum, in small and guarded doses. The second intention may be fulfilled by saline aperients as well as by diaphoretics, if the skin be harsh and dry, and the third by sedatives, especially bromide of potash and belladonna.

The therapeutic indications in cases of puerperal eclampsia are—first, to

arrest the convulsive action; and, secondly, to remove the cause of its recurrence.

During the convulsions the ordinary precautions, such as loosening the patient's clothing, and preventing her from biting her tongue, by inserting any suitable substance between the teeth, or from injuring her person in any way by proper restraint, should, in the first instance, be attended to.

One of the most effectual means of shortening the paroxysms is cold affusion in a small stream from a moderate height on the head and face. This remedy is of considerable antiquity, being recommended by Valescus, of Tarenta, in a work¹ originally published in the year 1482. It was reintroduced into practice on the authority of Denman, who derived great benefit in such a case by merely sprinkling his patient's face with cold water during the paroxysms—a very different practice, I may observe, from the copious cold affusions now recommended. In the asthenic form of eclampsia this remedy should be used cautiously. It should not be employed except during the convulsions, nor persevered in so long as to depress the circulation unduly.

In all cases the *primæ viæ* should be unloaded, as soon as the convulsions commence, by a bolus of calomel and jalap, or by a drop of croton oil placed on the tongue. Enemata of assafoetida and turpentine, suspended in thin gruel, may also be resorted to, and repeated if necessary.

The head should be shaved if possible, and the back of the scalp freely painted over with liquor epispasticus, whilst, at the same time, a bladder loosely filled with ice may be laid over the front of the head. The feet and calves of the legs should be enveloped in mustard poultices, until a decided rubefacient effect is produced.

In cases of sthenic puerperal convulsions, *venesection* is, notwithstanding the disusage into which blood-letting has fallen in all other diseases, still the only remedy of undoubted efficacy in subduing the convulsive action. If the patient be plethoric, and her pupils be contracted, showing cerebral congestion, we may, as a rule, bleed. If, on the contrary, the pupils are dilated, the condition of the brain may be considered as anæmic, and blood-letting would probably be out of the question. This rule is liable to many well-known causes of exception, as the state of the pupil may normally vary widely in different individuals, as well as be affected by various toxic agents.

The amount of blood that may be taken from a plethoric woman, suffering from eclampsia, should be measured by the patient's condition and the effect produced, rather than by the quantity abstracted. In one case I took nearly forty ounces of blood, and within a few hours twelve ounces more, but without any benefit. Generally, however, a very much smaller bleeding will suffice, and, as a rule, not more than from eight to twelve ounces of blood should be taken.

Chloroform is still regarded by some authorities as the remedy *par excellence* for puerperal convulsions: and though, according to my experience, this is an exaggerated estimate of the value of this anæsthetic, its inhalation is of unquestionable use in many cases. In hysterical convulsions, if sprinkling the face with cold water does not suffice, a few whiffs of chloroform will generally cut short the attack. In true puerperal convulsions, however, in which I have used chloroform pretty extensively in the manner originally suggested by the late Sir James Simpson, and have kept patients under its influence for several hours at a time, it requires to be used with great caution, its exhibition being obviously contraindicated where either the circulation is depressed, or where there is any tendency to apoplectic symptoms. But in suitable cases I have found chloroform most serviceable in subduing the convulsions and prolonging the intervals between them. If it be inhaled only during the paroxysm, chloroform appeared to have no effect in shortening the attack; but if exhibited before its expected return, it often prevents its recurrence for hours together, and gains time, during which the labour may be completed, and the patient placed in comparative safety.

¹ Valescus de Tarenta, *Philon. Pharmaceut. et Chirurg.* Lib. i., c. 27, p. 92. Franca, 1599.

Chloral was suggested by myself in a paper published four years ago, and has since been employed with varying success by other practitioners in England and America.

Opium, though recommended upon high authority,¹ is, in my opinion, clearly contraindicated in all cases of eclampsia during labour in which there is any tendency to apoplectiform symptoms.

The *tincture of veratrum viride* has been used as a substitute for blood-letting in cases of puerperal convulsions by Dr. Fearn, of Brooklyn. Dr. Fearn exhibited this remedy in very large doses in ten cases of this kind—"there being," he says, "no danger from the medicine as long as the convulsions continue."² I should, myself, prefer some safer plan of treatment than these heroic doses of so powerful a drug.

Belladonna was originally introduced into practice in these cases by M. Claussier fifty years ago,³ and has again been recommended by recent writers. My own experience in those cases in which I have seen it tried, would not lead me to attach any value to this drug in the treatment of eclampsia during labour. But in convulsions occurring before and after parturition, I have found small doses of belladonna most beneficial in calming the nervous susceptibility so intimately connected with convulsive action.

In every case of convulsions during labour our primary object should be to deliver the patient as speedily as is consistent with her safety and that of the child. This rule of practice was long since pointed out by Mauriceau—"La convulsion est un autre accident qui fait souvent périr la mère et l'enfant, si la femme n'est très promptement secourue par l'accouchement qui est le meilleur remède qu'on puisse apporter à l'une et à l'autre."⁴

The convulsions do not always cease when delivery is effected, or may even commence after it. Still these cases afford no argument against the general principle that, puerperal convulsions being obviously connected with the state of the gravid uterus, the sooner this condition is terminated the sooner will the convulsions cease. The manner of accomplishing this purpose must depend on the stage and character of the labour in each case. But if the symptoms be at all urgent, the former consideration may be in a great measure disregarded, and we should not then hesitate to deliver our patient by either version or the long forceps as soon as the os uteri can be opened sufficiently to enable us to do so. In these cases only, despite Dr. Blundell's excellent aphorism, "meddlesome midwifery," is not necessarily "bad midwifery."

With regard to the manner of effecting this, as a rule the dilatation of the os goes on during the convulsions, and by keeping our patient under chloroform we may generally attend the natural occurrence of the second stage of labour before being obliged to deliver. But in some cases, as I very recently had an instance, the os, after expanding to a certain extent, becomes rigid and undilatable, the convulsions meanwhile recurring with increasing violence. In such cases the perforator and crotchet were formerly freely resorted to. Thus, in no less than eight of Dr. Collins's thirty cases of convulsions, delivery was effected in this way. I cannot regard embryotomic or child-destroying operations as justifiable, even in these cases, for we now have it in our power to effect delivery without resorting to them, by dilating the os uteri with Dr. Barnes's dilators, or, where these fail, by incising the contracted circular fibres of the os with a guarded bistoury, as originally suggested by M. Dubosc of Toulouse, in 1781, so as to allow a living child to be delivered. Such an operation should, however, be only regarded as the *ultima spes*, and confined to those rare cases

¹ Manning on Female Diseases, p. 357: London, 1775. Romberg, a Manual of the Nervous Diseases of Man, Sydenham Society's Translation, vol. ii. p. 190: London, 1853. Schwartz, Ueber Eclampsia der Kreissenden, p. 54: Riga, 1851.

² Fearn, American Journal of Obstetrics, May, 1871, p. 28.

³ Claussier, Considerations sur les Convulsions qui attaquent les Femmes Encientes: Paris, 1823.

⁴ Traité des Maladies des Femmes Grosses, par François Mauriceau, 7th Edition, Tome Première, p. 335: Paris, 1740.

in which the delivery of a living child from a living mother cannot be effected by less hazardous means.

58. *Anæsthesia in Obstetrics; Nélaton's Method of Resuscitation from Chloroform Narcosis.*—Dr. J. MARION SIMS, of New York, read at the recent meeting of the British Medical Association, a paper on this subject, from which we make the following extracts:—

“Dr. CHARLES JAMES CAMPBELL, the distinguished accoucheur of Paris, has recently written two papers on anæsthesia in obstetrics,¹ in which he ably sustains the views long taught by Nélaton, that death from chloroform is due to syncope or cerebral anæmia. And amongst other strong arguments to prove his position, he gave a graphic description of a case of chloroform narcosis, which occurred in my practice in Paris, where M. Nélaton, by his method, unquestionably saved the life of the patient. She was young, beautiful, and accomplished, and belonged to one of the oldest and best families in France. Married at twenty, she gave birth to her first child a year afterwards. The head was enormous (hydrocephalic), impacted in the pelvis nearly twenty-four hours, and the delivery of a dead child was ultimately accomplished with instruments. Dr. Bouchacour, of Lyons, was called in consultation, and applied the forceps. In a week afterwards, the urine began to dribble away, and in a fortnight an immense slough was thrown off. The case, surgically considered, was one of the most interesting I ever saw, and the operation was one of the most difficult I ever performed on any one in her station in life. The base of the bladder was destroyed, and the fundus fell through the fistulous opening; it was therefore inverted, and protruded between the labia majora as a herniary mass of the size of an apricot, its external covering being the internal or lining membrane of the bladder, which was of a deep vermilion red colour. The vaginal portion of the cervix uteri and the posterior *cul-de-sac* were destroyed; and by the reparative process, the cervix and the posterior wall of the vagina were blended into one common cicatricial mass, which was firm, inelastic, and immovable. The case appeared desperate, and M. Nélaton had pronounced it incurable. A preparatory operation was necessary, viz., to open the cervix uteri, by dissecting it from the posterior wall of the vagina, and thus to reconstitute the canal of the vagina up to the canal of the cervix; and by a subsequent operation, to draw forward the flap thus formed, secure it to the neck of the bladder anteriorly, and thereby close the fistula. The first, or preparatory operation, was performed at the country house of the family near Dijon, on November 3, 1861, Dr. Dugast, of Dijon, assisting, and giving chloroform. The second, or operation for the radical cure, was performed on the 19th of the month at St. Germain, about an hour's distance from Paris by rail. M. Nélaton, Dr. Campbell, Dr. Beylard, Dr. Johnston, and Mr., now Dr., Alan Herbert, were present. I seldom give an anæsthetic in private practice for operation on the walls of the vagina, as the pain is generally not sufficient to call for it. But in this case, as the slightest touch was unbearable, an anæsthetic was indispensable. Dr. Campbell was selected by the family, as well as by M. Nélaton and myself, to administer the chloroform, especially as he was in the daily habit of giving it in his large obstetrical practice, and we all had entire confidence in his caution, skill, and judgment. The patient was soon anæsthetised. The operation was begun at 10 A.M., and I thought it would require about an hour to finish it.

“Many years ago I imbibed the convictions of my countrymen against chloroform in general surgery, and have always used ether in preference, never feeling the least dread of danger from it under any circumstances. It is otherwise with chloroform, and in this particular case I felt the greatest anxiety, frequently stopping during the operation to ask Dr. Campbell if all was going on well with the patient. At the end of forty minutes the sutures (twelve or

¹ 1. Mémoire sur l'Anesthésie Obstétricale; 2. Etude sur la Tolérance Anasthésique Obstétricale, par le Dr. Charles James Campbell, Ancien Interne de la Maternité de Paris, Ancien Chef de Clinique Obstétricale de la Faculté de Paris. G. Masson. 1874.

thirteen) were all placed, and ready to be secured, and I was secretly congratulating myself that the operation would be finished in a few minutes more, when all at once I discovered an unusual bluish livid appearance of the vagina, as if the blood were stagnant, and I called Dr. Johnston's attention to it. As this lividity seemed to increase, I felt rather uneasy about it, and I asked Dr. Campbell if all was right with the pulse. He replied, 'All right, go on.' Scarcely were these words uttered, when he suddenly cried out, 'Stop! stop! No pulse, no breathing;' and looking to M. Nélaton, he said, 'Tête en bas, n'est-ce pas?' Nélaton replied, 'Certainly; there is nothing else to do.' Immediately the body was inverted, the head hanging down, while the heels were raised high in the air by Dr. Johnston, the legs resting one on each of his shoulders. Dr. Campbell supported the thorax. Mr. Herbert was sent to an adjoining room for a spoon, with the handle of which the jaws were held upon, and I handed M. Nélaton a tenaculum, which he hooked into the tongue, and gave in charge to Mr. Herbert; while to Dr. Beylard was assigned the duty of making efforts at artificial respiration, by pressure alternately on the thorax and abdomen. M. Nélaton ordered and overlooked every movement, while I stood aloof and watched the proceedings with, of course, the most intense anxiety. They held the patient in this inverted position for a long time, before there was any manifestation of returning life. Dr. Campbell, in his report, says it was fifteen minutes, and that it seemed an age. My notes of the case, written a few hours afterwards, make it twenty minutes. Be this as it may, the time was so long, that I thought it useless to make any further efforts, and I said, 'Gentlemen, she is certainly dead, and you might as well let her alone.' But the great and good Nélaton never lost hope, and by his quiet, cool, brave manner, he seemed to infuse his spirit into his aids. At last there was a feeble inspiration, and after a long time another, and by and by another; and then the breathing became pretty regular, and Dr. Campbell said, 'The pulse returns, thank God; she will soon be all right again.' Dr. Beylard, who always sees the cheerful side of everything in life, was disposed to laugh at the fear I manifested for the safety of our patient. I must confess that never before or since have I felt such a grave responsibility. When the pulse and respiration were well re-established, M. Nélaton ordered the patient to be laid on the table. This was done gently. But what was our horror, when, at the moment the body was placed horizontally, the pulse and breathing instantly ceased. Quick as thought, the body was again inverted, the head downwards, and the feet over Dr. Johnston's shoulders, and the same manœuvres as before were put in execution. Dr. Campbell thinks it did not take such a long time to re-establish the action of the lungs and heart as in the first instance. It may have lacked a few seconds of the time; but it seemed to me to be quite as long. For the same tedious, painful, protracted, and anxious efforts were made as before; and she seemed, if possible, more dead than before; but, thanks to the brave men who had her in charge, feeble signs of returning life eventually made their appearance. Respiration was at first irregular, and the pulse could then be counted; but it was very feeble, and would intermit. I began again to be hopeful, and even dared to think that at last there was an end of this dreadful suspense, when they laid her horizontally on the table again, saying, 'She is all right this time.' To witness two such painful scenes of danger to a young and valuable life, and to experience such agony of anxiety, produced a tension of heart and mind and soul that cannot be imagined. What, then, must have been our dismay, our feeling of despair when, incredible as it may seem, the moment the body was laid in a horizontal position again, the respiration ceased a third time, the pulse was gone, and she looked the perfect picture of death? Then I gave up all as lost; for I thought that the blood was so poisoned, so charged with chloroform, that it was no longer able to sustain life. But Nélaton, and Campbell, and Johnston, and Beylard, and Herbert, by a consentaneous effort, quickly inverted the body a third time, thus throwing all the blood possible to the brain, and again they began their efforts at artificial respiration. It seemed to me that she would never breathe again; but at last there was a spasmodic gasp, and, after a long while, there was another effort at inspiration; and, after another long interval, there was a third; they were 'far between;' then we watched, and waited, and wondered if there would ever be a fourth; at length it came,

and more profoundly, and there was a long yawn, and the respiration became tolerably regular. Soon Dr. Beylard says, 'I feel the pulse again, but it is very weak.' Nélaton, after some moments, ejaculated, 'The colour of the tongue and lips is more natural.' Campbell says, 'The vomiting is favourable; see, she moves her hands; she is pushing against me.' But I was by no means sure that these movements were not merely signs of the last death-struggle; and so I expressed myself. Presently Dr. Johnston said, 'See here, doctor; see how she kicks; she is coming round again;' and very soon they all said, 'She is safe at last.' I replied, 'For Heaven's sake, keep her safe; I beg you not to put her on the table again till she is conscious.' This was the first and only suggestion I made during all those anxious moments, and it was acted upon; for she was held in the vertical position till she, in a manner, recovered semi-consciousness, opened her eyes, looked widely around, and asked what was the matter. She was then, and not till then, laid on the table, and all present felt quite as solemn and as thankful as I did; and we all in turn grasped Nélaton's hand, and thanked him for having saved the life of this lovely woman.

"In a few minutes more, the operation was finished, but, of course, without chloroform. The sutures were quickly assorted and separately twisted, and the patient put to bed; and, on the eighth day thereafter, I had the happiness to remove the sutures in the presence of M. Nélaton, and to show him the success of the operation.

"I have detailed the circumstances of this interesting case at great length, because I believe it goes as far to establish a principle of treatment as any one case ever did, or possibly can.

"If the recovery had been complete and perfect with the first effort at reversing the body, there might have been a doubt whether the vertical position was really the cause of resuscitation; but, when the horizontal position was again and again followed by a cessation of all evidence of life, and when life was again and again re-established by a position that favoured only the gravitation of the blood (poisoned as it was) to the brain, the inference is very clear that death in such cases is due to syncope or cerebral anæmia. Exhaust the brain of blood in any way, and death follows. Fill it speedily with blood again, and life returns."

Dr. S. related a second case to illustrate this treatment, which he stated had been resorted to successfully by Dr. Schopert, of New Orleans, and E. L. Holmes, of Chicago.

"Ten years ago, there was a story prevalent in Paris that M. Nélaton had derived the hint of reversing the body in chloroform-poisoning from a discovery accidentally made by his little son, then some seven or eight years old; that the little boy had killed some mice with chloroform; that, without thought or reason, he had taken up a dead mouse by the tail, and was twirling it round, when, to his surprise, it began to manifest signs of life, and recovered entirely, while the mice left lying were dead; and that the great surgeon was thus taught a great lesson, if not by babes and sucklings, at least by a little boy. This is a very pretty story as it is, and it seems a pity to spoil it. A few days ago, when in Paris, I called to see young Nélaton (who is now a student of medicine, and will graduate next year), and I asked him for the facts of the mouse story. He said that when they lived on the Quai Voltaire, the house was infested with mice; that great numbers were caught in traps almost daily; that he was in the habit of killing them with chloroform by covering the trap with a napkin and pouring the chloroform on it; and that his only idea was that of an easy death for the mice. One day, when he had given a happy despatch to some mice, his father accidentally came into the room, and, seeing the dead mice, he told his son if he would take up one by the tail, and hold it with the head downwards, that it would revive, while the others would not. He did this, and found it was true. And he told me that he had, when a boy, performed the same experiment on mice some forty or fifty times or more, and always with the same unvarying result. He says that he has often heard his father speak, not only of the case that occurred at St. Germain, but of other cases that he had saved in the same way before the time of the mouse story, which dates back to 1857 or 1858."

"I believe that obstetrics may take a lesson from Nélaton's method of resusci-

tation, by adopting it in cases of threatened death from *post-partum* hemorrhage. Let us not be satisfied with simply placing the head low; but let us, in addition to the means usually adopted, invert the body, and throw what little blood there is left in it wholly to the brain. I have never seen a death from uterine hemorrhage; but from recollections of the few alarming cases I have witnessed, I now feel sure that recovery might have been hastened if I had known of and adopted Nélaton's method of inversion.

"Whether death from chloroform is due to cerebral anæmia or not, it is at least safe to adopt Nélaton's method in all cases of supposed or threatened danger; but I think the safest plan is to relinquish the use of chloroform altogether, except in obstetrics. The frequent cases of death from the use of chloroform in surgical operations that have occurred amongst us, even of late, should warn us to give up this dangerous agent, if we can find another that is as efficient, and, at the same time, free from danger. Ether fulfils the indications to a remarkable degree; but, while it is safe, it is unfortunately unpleasant to the physician and bystanders, as well as to the patient. He who will give us an anæsthetic as pleasant to take as chloroform and as safe as ether, will confer the greatest boon upon science and humanity."—*Brit. Med. Journ.*, August 22, 1874.

Another equally remarkable case of apparent death from chloroform narcosis relieved by inversion was related by Sir JOHN ROSE CORMACK, which occurred in his practice. Several times the patient relapsed into alarming unconsciousness on being replaced in a horizontal position, and each time on inversion of the body resuscitation followed.

59. *Accidents that may happen to Pregnant Women suffering from Disease of the Heart.*—Dr. MICHEL PETER, of Paris, in a paper read before the Section of Medicine of the British Medical Association, remarked that women suffering from an organic disease of the heart, who become pregnant, are exposed to accidents that may strike the lungs, impede gestation, and aggravate the state of the heart. The pulmonary accidents are production of an extremely rapid double congestion of the lungs, with spitting of blood, and asphyxia, or capillary bronchitis, or lobular pneumonia, or double pleurisy. The accidents of gestation are miscarriage, with the death of the fœtus. The cardiac accidents are the acceleration or aggravation of the general disorders attending organic diseases of the heart, namely, dyspnœa, painful palpitation, visceral congestion, anasarca. Pulmonary accidents and miscarriage happen ordinarily towards the middle of the gestation, and especially in the course, or towards the end, of the fifth month. These results were derived from eight cases, four observed by the author, and eight by Professor Sée, at La Charité, in Paris; M. Budin, house physician at the Hospital St. Antoine, in Paris; and M. Seuvre, house physician at La Maternité, of Paris; each of those physicians having observed their cases after their attention had been called upon these facts by the author. All these women but one were not at their first gestation; they had their attacks, one at her second pregnancy, three at the third, one at the sixth, one at the fifteenth; and one of them, after having miscarried at her third gestation, miscarried again at her fourth and fifth; another, who miscarried at her sixth gestation, had again two successive miscarriages; at length the one who miscarried at her fifteenth gestation had also two successive miscarriages. The meaning of these facts is, that their heart was a fatigued one, both by the increase of work caused by pregnancy, and the more remote date of the disease of the heart. The production of the pulmonary accidents is due to the augmentation in the total mass of the blood, which increases necessarily as increase the wants of the fœtus. Thence the occurrence of these accidents, not at the beginning of the pregnancy, but after some months. The augmentation in the total mass of the blood, caused by pregnancy, produces, physiologically, plethora in the lungs, and, in some women, dyspnœa, and even spitting of blood. The disease of the heart involves morbid congestion of the lungs, hence a pregnant woman with disease of the heart is doubly exposed to pulmonary accidents. The gestation produces an hypertrophy of the left ventricle, so that morbid regurgitation of blood in the lungs is increased by the state of heart. In seven

cases, the organic disease of the heart was an insufficiency of the mitral valve (complicated, in two cases, by a stricture of the orifice). In one case only the disease was a stricture of the aortic orifice. Two of the women died in consequence of their pulmonary accidents and miscarriages, and the six who recovered were afterwards rendered miserable by the severe and permanent aggravation in the disorders of the disease of their heart. The recovery was due to medication both energetic and rapid. The practical consequences of these facts are the following: 1. A woman diseased at the heart should not be a mother; 2. If she become pregnant, the physician must attentively survey her respiratory functions, and intervene energetically as soon as pulmonary disorders begin; 3. If the woman be safely delivered, she must not nurse her child, in order not to fatigue more her diseased heart; 4. Reciprocally, when a pregnant woman suffers towards the middle of her pregnancy, very severe pulmonary disorders, or when she miscarries by them, the physician must consult her heart, and perhaps he will thus discover a disease of the heart till then unknown or mistaken. In the cases observed by Dr. Peter there were no symptoms of toxæmia.—*Brit. Med. Journ.*, Aug. 29, 1874.

60. *Explanation of the Rigor which so often attacks Puerperal Women immediately after the Birth of the Child.*—There have been many explanations given of the cause of this rigor, agreeing only in not considering it pathological, but physiological.

PfANNKUCH (*Archiv f. Gen.*, Band iv. Heft 2), after noticing the principal of these, as, for instance, the sudden loss of blood; the sudden withdrawal of the blood from the surface, caused by the emptying of the uterus, and consequent lessening of the pressure to which the great vessels have been subjected; the exposure of the woman during the latter part of labour, or her lying in sheets damp with the escape of the waters; and after giving reasons for being dissatisfied with them all, adds the following explanation of his own: The experiments of Wurster have shown that the temperature of the foetus in utero is at least $0^{\circ}.9$ higher than that of the mother. It follows from this that every pregnant woman has a second centre of warmth in her uterus; but her own temperature is not thereby increased, so she must be producing less warmth than if not pregnant. The moment the child is born, and this centre of warmth removed, there is at once a disproportion between the amount of heat produced and that given off; the effort to bring about an equilibrium is what causes the rigor. The intestines are, it is well known, most susceptible to heat and cold, and it is from their immediate vicinity that this source of heat is removed. The uterus, too, having sunk down towards the pelvis, the intestines come to touch the abdominal walls, which are often very much thinned, and thereby suffer a further loss of heat, which produces a powerful influence on the nerve centres.

This view is further supported by the fact that if the child dies during pregnancy, the mother is often subject to rigors, and complains of a feeling of coldness in the abdomen. It follows at once from this, that, if the view that Pfannkuch takes is correct, there can in such cases be no rigor following the birth of the child. In the few cases of this sort that he has had since embracing the above theory, there was no such rigor; and he thinks, that, should a rigor occur under such circumstances, we should give a guarded prognosis, the cause of such being probably pathological.—*Irish Hospital Gaz.*, Sept. 1, 1874.

61. *A New Sign of Pregnancy.*—In the *Annales de Gynæcologie*, March 15, 1874, M. le Prof. Pajor describes a new sign of pregnancy, which he calls "le choc fœtal," or the fœtal impulse. The sensation it conveys to the hand of the person making the examination is similar to that conveyed by ballottement; but it differs from ballottement in being produced by an active and spontaneous movement on the part of the foetus. It is available before the other certain signs, and is therefore most valuable in cases of doubtful pregnancy at the third or fourth month. Of course it is not always to be felt, and this may entail on the patient the unpleasantness of several examinations.—*Irish Hospital Gaz.*, Sept. 1, 1874.

AMERICAN INTELLIGENCE.

ORIGINAL COMMUNICATIONS.

Case of Delivery of a Child weighing only one pound and three-quarters; Child now Living. By GEO. A. MURSICK, M.D., of Nyack, New York.

Dr. Isham, in his article on Premature Births (in the April No. of this *Journal*), states that, after considerable research, he is only able to find recorded four cases of *small* births, of two pounds and under, which lived and increased to a period beyond any doubt of their inherent capacity to exist. He gives a brief history of the four cases referred to, and reports two cases of his own, making six in all. These cases—aside from their general interest to the practitioner—are of importance from a medico-legal point of view. I therefore report the following case which occurred in my practice.

CASE. On the morning of the 29th of April last, I was called to attend Mrs. M., a young married woman, whom I found in labour with her first child at the beginning of the eighth month of her pregnancy. I was informed that the waters had been dribbling away for a week, in small quantities, and that during the previous afternoon a large quantity had come away with a "sudden gush," since which time she had had pains at irregular intervals. The os was but slightly dilated. During the day the pains increased in force and frequency, the os gradually dilated, and early in the evening she was delivered of a male child which weighed *one pound and three-quarters*. It appeared well formed, and healthy. As the mother had no milk, it has since been nursed from the bottle. It is now more than three months old, is thriving, and weighs three and one-quarter pounds. I am quite certain that the period of gestation could not have been much over seven months, for the reason that the mother called at my office on the 25th of Nov. 1873, for relief from a supposed "bladder disease," for which she had been treated by a neighbouring practitioner for several weeks, without benefit. Upon examination, I found the uterus *retroverted and enlarged*, the cervix pressing against the urethra; and upon questioning her, she informed me that she "had missed" her last menstrual period, and that it was not yet time for the next one. I informed her that she was probably pregnant, which she doubted; but time proved the correctness of the diagnosis. The retroversion was relieved, and the womb held in proper position by a Hodge's lever pessary, which she wore for two months, after which she had no further trouble until I was called to her confinement.

Case of Double Uterus. By O. COOLEY, M.D., of Chicago, Ill.

J. R., æt. 33, consulted me May 30, 1873; she was in the thirteenth year of her married life, had borne three children, and suffered four miscarriages. The last of these occurred two years since at the fifth month of utero-gestation. Six hours after the expulsion of a well-formed fœtus

and placenta, she discovered a sac in the vagina, which immediately ruptured, and a second fœtus with appendages complete was extruded. She detailed an accurate history of intra-uterine inflammation, extending over a period of eight years, which was confirmed by investigation. The menses, after several irregular and defective returns, had entirely ceased two months before.

Constitutional and local treatment were employed, the latter involving caustic applications to the lining membrane of the uterus, to its fundus, weekly during June, July, August, and part of September. Late in July a tumour presented in the anterior wall of the vagina, midway between the os uteri and bladder, presumed to be an abscess in the cellular tissue. It however remained unchanged, and soon its upper margin was distinctly felt above the pubis, irregularly globular, lying at the right of the linea alba. The tumour steadily increased, and was the seat, at intervals, of distressing pain of a burning, tearing nature. Movements indicative of fœtal life were detected in September, and local remedies withheld. The developments of the following month compelled a belief in the existence of an extra-uterine pregnancy. November 9th, in consultation, Drs. Byford and Heydock thoroughly examined the patient. A double uterus, or uterus with two cavities, was the explanation of the unusual phenomena arrived at. The points of differential diagnosis between the two conditions are given in the language of Dr. Byford:—

“The thickness of the tissues covering the fœtus is too great to be formed by the abdominal wall alone, and the motions are too distinct to justify the opinion that the ovum is in contact with the abdominal peritoneum. The fœtal head occupies the brim of the pelvis; ballottement can be performed very perfectly. The tissues underlying the head seem to mount up around it, and when the finger is carried up beside the head the envelope appears the same in thickness as in ordinary pregnancy. The finger cannot be passed up between the uterus, in which the probe is inserted about four inches, and the head of the fœtus.” “I have not seen,” writes Dr. Byford further, “a case of extra-uterine pregnancy where these conditions all existed. Generally the fœtus is felt very near the abdominal walls; the motions are very obvious; the head does not occupy the brim of the pelvis; ballottement is impracticable, and when the fœtus is near the pelvic brim, fingers may be carried around the uterus, and this organ be isolated from the substance of the ovum.”

The correctness of these views was confirmed ten days later by the birth of a living child of from six to seven months' development after a perfectly natural labour of four hours' duration. Absolute proof was afforded of the existence of two cavities, in May of this year, by Dr. Byford, which I have had frequent opportunities of confirming. An examination revealed a cervix normal in length, but broader than is usual at the base. The os externum perfectly natural. A sound passed readily to the fundus of a cavity, the axis of which pointed a little to the left of the median line. Depth $2\frac{1}{4}$ inches. A second sound found entrance near the first, but turned to the right and required a sharper curve to follow its canal. Depth $1\frac{3}{4}$ inches. When rotated the sounds could not be approximated nearer than from $\frac{1}{3}$ to $\frac{1}{2}$ an inch excepting where they crossed in the cervical canal.

The two uteri are therefore side by side, the right a little anterior, and their axes slightly divergent. Both are included in one envelope, but separated by a firm wall, and capable of development as witnessed in the gestation described.

CHICAGO, Sept. 7, 1874, 260 E. Halsted Street.

Rigidity of Os Uteri treated by Chloral. By F. S. THOMAS, M.D., of Macedonia, Iowa.

I have employed hydrate of chloral in a number of cases of "rigidity of the os," with the best results. I first try to dilate by the usual method (with index and middle fingers). If this fails, as it surely will in some cases, I resort to chloral given in doses of ten to fifteen grains every ten to fifteen minutes, until the desired effect is produced.

I have never failed to hasten labour, or to change it from the first to second stage, when the first stage of labour has been prolonged by an undilatability of the os uteri. I would not advise giving chloral in sufficient doses to produce complete anæsthesia. Since I began using chloral in my obstetrical cases (about a year ago) I find by comparison with previous years, that I am not detained more than one-half as long as heretofore.

Chloral Hydrate in Malarial Congestion. JNO R. TAYLOR, of Kosse, Texas, writes to us that chloral hydrate with bromide of potassium has a magical effect in relieving malarial congestion. He thinks that the chloral has some peculiar specific effect on malarial poison.

Hair-pin in the Female Bladder. Reported by F. S. SHARPE, M.D., of Natchez, Miss.

On the morning of the 5th of March Dr. Jno. C. Inge and myself were sent for to visit Miss K., and learned "she had a hair-pin in the place the water comes from." Thinking she might be mistaken, we examined the vagina and uterus very cautiously, and afterwards introduced a female catheter into the urethra, but failed at first to detect the pin; after further exploration, however, I distinctly felt the foreign body in the bladder.

As our manipulations gave her pain and produced exhaustion, we postponed further operations and directed her to remain quietly in bed until our next visit. On the 11th we called again, and found her very comfortable; I attempted now to grasp the pin with a pair of long-handled forceps, but failed. We then decided to dilate the urethra with a sea-tangle tent, which was introduced on the evening of the 12th, when dilatation gradually followed until the diameter of the urethra reached one-half an inch, sufficiently large for the hair-pin to pass unassisted during the next urination. After this the case progressed satisfactorily, neither inflammation, irritation, nor incontinence following.

The pin is 3 inches long, and was covered almost entirely with an earthy deposit, and passed out of the bladder through the urethra *points foremost*, without exciting the least irritation or giving the slightest pain.

The history of the case, as far as the introduction of the pin is concerned, is not altogether satisfactory.

According to her statement, on the night of the 28th of February, whilst in bed, "she felt something crawling about her privates," took a hair-pin to relieve herself of the unpleasant sensation, and soon fell asleep. Next morning she did not mention the fact to her parent, but tried several times each day to remove the pin, until the morning of the 5th of March, when she passed with her urine a large quantity of blood; this alarmed her and caused her to acquaint her mother with the circumstance, and we were then consulted.

An important fact connected with this is that the gradual dilatation

was *not* followed by incontinence of urine, though Dr. Emmett¹ reports seven cases of incontinence caused by dilatation, and declares the method neither safe nor justifiable.

Notwithstanding this *dictum* of so high an American authority, I followed the practice of Hôtel Dieu, Paris, and the practice in the Dublin hospitals, and with the happiest result.

Report of a Case of Gunshot Wound of Head. By J. F. GLADNEY, M.D., of Homer, La.

A robust negro, aged 24 years, received, July 29th, 1874, at 2½ o'clock P. M., a gunshot wound, the ball penetrating the cranium, through the frontal bone, about one-fourth of an inch above the frontal eminence on the right side, passing through the gray and white matter of the right hemisphere, the distance of three inches, then passing between the lobes, and was found at the autopsy lodged near the centre of the occipital bone. The negro stated that his face was turned downwards when shot. I saw the man soon after the wound was inflicted.

He was rational, circulation good, and suffering but little pain. I was informed that for about fifteen minutes after receiving wound, the patient was unconscious. I visited him frequently until his death, and he was in full possession of his mental faculties, asking for water, and taking the fluid nourishment prescribed. He related (on the fourth day) the circumstances which led to his receiving the wound, his statement corresponding with that made by others. He slept well at night, but during the day suffered occasionally with paroxysms of pain, which were invariably relieved by one-eighth grain of morphia. Bowels readily moved with sulph. magnesia. No evidence of paralysis about the limbs, tongue, or facial muscles. Taste unimpaired. Pulse ranging from 70 to 80. On second day the temperature as indicated by thermometer was 99°. The mercury in instrument used stands at 98¼ in health. On the other days the temperature was normal.

Death occurred at 6 o'clock, on the morning of July 4th following. About three hours before death he suffered severe pain, and became comatose one hour before death.

DOMESTIC SUMMARY.

Treatment of Fractures of the Femur by Immovable Apparatus, and especially by Plaster of Paris on the form of Continuous Roller.—The number of the *New York Med. Journ.* for August last has an extremely interesting paper on this subject by Dr. FRANK H. HAMILTON, who is high authority in regard to the matter. His conclusions he thus expressed: While I recognize the convenience and utility of plaster of Paris, and of other immovable forms of dressings, in the treatment of certain fractures, it has not proved satisfactory, under my observation, when applied in the treatment of fractures of the femur; and especially when applied immediately after the occurrence of the fracture—my own method of treating these fractures, without perineal bands, with side-splints, adhesive-plaster extension, pulley and weight, having given better results (with no accidents) in the adult. In the case of children, my double thigh-splint has

¹ Vide Vesico-vaginal Fistula from Parturition and other causes, with cases of Recto-vaginal Fistula, by Thomas Addis Emmett, M.D., p. 42.

also given better results than has plaster of Paris. These methods are far in advance of the double-inclined planes, and of Desault's, Boyer's, Hagedorn's, Gibson's, and other long splints. They avoid all danger of ligation and strangulation of structures; there is no perineal band to cause ulceration; extension is made by a method which equally—when properly applied—shuns the danger of ulceration about the heel, an accident so common with the old gaiter—the patients are comfortable; the limbs are seldom united with deformity; and the average shortening is less than with any other method yet devised. From these methods to the method now employed so much at Bellevue, is, in my opinion, a step backward.

Condition of a Faithful Measurement of the Thigh.—The fact that a man walks without a halt is no evidence that there is no shortening of the limb. In this regard patients are very unequal; one, having a shortening of only half or three-quarters of an inch, will limp perceptibly; while another, with a shortening of one inch or even one inch and a half, may not limp at all. This has been observed repeatedly. Nor is it any evidence that the limb is not shortened because, while lying in bed, the heel of the broken limb can be brought down to the level of the other. By pitching the pelvis, the spine remaining erect, the heel may be made to descend, in most persons, two inches or more.

Measurements made from the symphysis pubis, or from the round end of the anterior superior spinous process, are unreliable.

The patient should repose upon his back, upon an even surface, with his lower extremities as nearly as possible in a line with the axis of his body, the two wings of the pelvis being in the same horizontal (transverse) line.

A flexible, graduated tape-line is to be preferred to the steel tape-measure. The foot being steadied by an assistant, the surgeon should put his thumb-nail against the line where it joins the ring, and push his nail into the skin just *below* the anterior superior spinous process of the ilium, pressing firmly up and back, the back of his nail resting upon the skin. In this he obtains a fixed point, and he can obtain an exactly corresponding point upon the opposite side. Below, the measurement may be made from either malleolus, but the outer has the most defined extremity, and is generally preferred. In most cases, for some months after the close of the treatment there is some œdema about the ankle, which renders it necessary to use great care in determining the point of the malleolus. The thumb-nail of the opposite hand may be used for this purpose, resting vertically upon the skin (flat against the lower end of the malleolus).

There are a few sources of error which cannot be avoided. Occasionally, but very rarely indeed, as the observations of Prof. C. La Ford have shown, the malleoli of the two limbs are of unequal length; and, in a few very rare cases, one limb is congenitally, or from defective growth, shorter than the other.

Prolapse of the Umbilical Cord, its Cause and Treatment.—Dr. GEO. J. ENGELMAN, of St. Louis, concludes an elaborate article on this subject (*Am. Journ. Obstetrics*, Aug. 1874) with the following *resumé*:—

“I will sum up in a few words the facts and the laws established by the examination of our prolapse cases.

“The causes of the prolapse of the umbilical cord have mainly proved to be such circumstances as prevent the complete filling of the pelvic brim, and the close adaptation of the lower segment of the uterus to the presenting part. One of the more important of these circumstances is the shape of the presenting foetal part itself, and we thus find that foot presentations are most frequently complicated by prolapse, whereas vertex presentations are least threatened.

“The foetal appendages are of secondary and minor importance; undue length of the cord, its marginal insertion, or attachment of the placenta low down in the uterus can never be direct causes of the accident; excess of liquor amnii is alone to be feared.

“Some stress is to be laid on abnormality in shape and position of the womb, much more upon twin births. More dangerous than any of these is the contracted pelvis, which I have proved by measurements and numbers to be the main cause of prolapse of the funis, directly and indirectly; a fact hitherto

generally accepted, but never as yet clearly established. Another such vague, general statement, that the prolapse is by far more frequent among multiparæ than among primiparæ, our cases disprove; they show that primiparæ are, comparatively speaking, almost as frequently afflicted as multiparæ.

"The law governing the location of the prolapse is of importance, and here for the first time touched upon; it will, I trust, be verified by the investigation of other observers.

"The post-mortem examinations revealed only the lesions due to death from asphyxia, nothing characteristic for death caused by prolapse of the cord.

"The prognosis we can give is somewhat better than generally allowed; most favorable for foot presentations, after these for shoulder and transverse presentations, while vertex presentations are more dangerous than any; the case being, under all circumstances, more threatening when occurring in a primipara.

"In the treatment of our cases the high importance of the postural method has been developed, more as an adjuvant, however, than as a method in itself of dealing with the prolapse.

"Version is comparatively the most successful of all operations, and should be more frequently resorted to when any choice of method is given, as in head presentations; the application of the forceps and reposition of the cord are less to be relied upon; but whatever may be the course determined upon, it must be borne in mind that the success of all operations, by which we seek the preservation of the child, whose life is threatened by compression of the prolapsed cord, is in a measure dependent upon the judicious use of chloroform, its application to full surgical anæsthesia."

Aneurism of the Left Subclavian Artery Cured by Distal Ligation.—Mr. R. A. McLEAN reports (*Western Lancet*, July, 1874) the following case, which occurred in Prof. TOLAND's clinic at the San Francisco City and County Hospital.

John Cross, æt. 50, miner, was admitted into Prof. Toland's ward, Jan. 8, 1874, suffering from a large pulsating tumour at the root of the neck, on the left side. Its superior surface was limited internally by the sterno-clavicular articulation and anterior margin of the sterno-cleido-mastoid muscles, and externally by a point beneath the anterior border of the trapezius, just above its clavicular origin. In the interval between the sterno-mastoid and the trapezius, it formed an ovoid tumour apparently as large as the closed hand. Auscultation and palpation elicited the usual signs of subclavian aneurism, which were well marked in every particular.

The patient first noticed a slight enlargement above the clavicle a year before, but its progress had been slow until within the two months prior to his admission into the hospital. During this time, however, it had increased rapidly in size. Partial paralysis of the left arm had occurred, from pressure upon the brachial plexus, and pressure upon the thoracic duct, interfering with nutrition, had caused anæmia to a considerable degree. A tonic course of treatment and good diet were prescribed, and kept up until January 24th—a period of nearly three weeks. During this time the tumour continued to increase in size, but the patient's general health was so much improved that Professor Toland decided to operate Saturday, January 24th. The Professor thought the Hunterian operation impracticable, as the tumour involved the first as well as the second and third parts of the vessel; and he accordingly selected the distal operation. The third portion of the axillary artery was chosen for the seat of the ligature. The artery was secured by double ligatures. The pulsation in the tumour was perceptibly lessened immediately after the ligature, and gradually decreased up to the sixth week from the date of the operation, after which no pulsation or bruit could be discovered. The ligatures came away on the twentieth day after the operation, and the wound healed a few days afterwards.

Since the circulation has ceased in the tumour, it has gradually grown smaller and less painful. The collateral circulation has become fully established, the paralysis has almost entirely disappeared from the arm, and the pressure upon the thoracic duct is evidently much less, as the patient has gained considerably in weight. His general health is good, though the left arm is slightly œdema-

tous, from pressure upon the subclavian vein. The tumour is at least one-third smaller than when the operation was performed. It is hard to the touch, and is evidently being rapidly absorbed.

This case is a remarkable one, showing as it does the benefit of surgical interference in a condition almost hopeless. Hitherto, cases involving such extensive disease of the artery, have usually terminated fatally. The Hunterian, or proximal, operation was deemed impracticable on account of the deep situation of the healthy portion of the vessel, and the large size of the tumour, which of itself would have proved an insurmountable obstacle, covering as it did the route by which the vessel might have been reached in a case not involving so great a degree of disease of the artery. Galvano-puncture and the distal ligation remained as the last resort. The latter was chosen with the view of resorting to the galvano-puncture if Brasdor's operation failed. It happily succeeded, which with a former case of Professor Toland's, are the only successful cases recorded of the distal ligation for the cure of subclavian aneurism. Gross has collected twelve cases of ligature of the subclavian artery in the first portion of its course, and seven cases of the distal ligation of various arteries for the cure of subclavian aneurism.

It will be seen from these tables that death resulted, in seventeen out of nineteen of these cases, from hemorrhage; the seat of the hemorrhage being, in nearly every instance, at the distal side of the ligature. It seems reasonable to suppose that this accident might have been avoided in at least some of the cases, if the double ligature had been used. In single ligation the proximal side of the vessel does not generally slough, because the point of ligation is at the junction of the sheath and artery, thus leaving the nutrition of the vessel uninterfered with. The sloughing occurs on the distal side of the vessel; and as that end of the artery remains patulous, hemorrhage is the result. The reason for this is apparent, when we consider that the denuded portion of the artery is deprived of its channels of nutrition through the vaso-vasorum, to an extent varying with the degree of laceration of the sheath. This result is well illustrated in two cases in which the subclavian was tied on the inside of the scaleni muscles. The first was the case of Dr. Rodgers, in which death occurred on the fifteenth day from hemorrhage. The other was the case of Professor Parker, death resulting from hemorrhage on the forty-second day.

When the double ligature is practicable the advantage is that the denuded portion of the artery between the two ligatures sloughs without leaving either the proximal or distal side of the vessel patulous, thus securing all the advantages to be gained by ligating the vertebral and thyroid axes separately.

Microscopical Appearance of the Brain of the Insane.—Dr. WALTER KEMPSTER, of the Northern Asylum for the Insane, Oshkosh, Wisconsin, presented to the Chicago Society of Physicians and Surgeons (*Medical Examiner*, June 15, 1874) some "Notes on the Microscopical Appearances of the Brain of the Insane," based on the examination of forty-nine cases. So far as the author knows, excepting the observations of Dr. Tuke (*Edin. Medical Journal*, September, 1868) these are the only cases in which especial attention has been directed to the abnormalities found in the brains of those who die while insane.

The student is met with the stereotyped phrase that there are no discernible lesions peculiar to insanity. For a number of years Dr. Kempster has been making systematic microscopical study of the brain, and has examined the lesions of all forms of insanity, from acute mania to dementia, including puerperal and epileptic insanity.

In each and all forms he has found a marked lesion—so that certain lesions may be grouped together as common to certain forms of insanity, and to which lesions any particular type of insanity is palpably due. There is a wide difference between the lesions of acute and chronic mania.

1. In certain forms of insanity, and notably in dementia, the finer capillaries show marked indications of disease, the peri-vascular sheath surrounding the vessel is distended, so much so, that sometimes the vessel itself appears to lie in a tunnel, its calibre being much less than the sheath, doubtless due to repeated capillary congestions of the vessels often diseased—irregular in calibre, suggest-

ing the idea of aneurismal dilatations, but entirely distinct from the miliary aneurisms so ably described by Charcot.

II. Next there is a degeneration, best studied in cases of dementia of syphilitic origin, and in the medulla oblongata, in the wall of the capillary, presenting dark-red patches at various points outside its walls, which gradually thicken, and appear to be due to a fatty metamorphosis or atheroma. The description by Meynert, though accurate, is by no means so complete as could be desired.

III. In 1871, while examining a section taken from the gray and white matter of the third left anterior convolution, there was a peculiar appearance of the tissue. Situated in the white substance, but very closely to the gray matter, there were a number of small *white spots*, some round, some ovoid, clearly defined, in sharp contrast with the nerve tissue, varying in size, from 1-50 to 1-200 of an inch in diameter—these appeared to be of a granular consistence, and much more dense in structure than the surrounding brain substance; each disconnected from the other, and normal white matter intervening. They did not absorb carmine, and were not connected with the capillaries. On the surface of some of the spots are fibres of connective tissue and crystals of margarine. To determine the true character of these spots and the degeneration, certain very elaborate and extensive micro-chemical manipulations were made, not here necessary to be stated. On allowing a section to dry, either with or without the nitric acid treatment, these spots appear to project above the surface of the section. By teasing, they may with difficulty be removed. None of these spots have been observed in the gray matter. They are most numerous in the medulla oblongata, and may be found in the white matter of the spinal cord.

IV. There is another form of degeneracy, one which was found in the cases of acute mania. The spots are less in size; are far more numerous than in the other variety (3); resist carmine staining; do not possess the granular characteristic; there are no spindle-shaped fibres of connective tissues about them; they behave very differently under the micro-chemical tests applied to the other variety of spots. The points of resemblance are mainly in colour and apparent density. Neither of them have any investing membrane.

V. A fifth variety, as large in size as the third, possesses a dense investing membrane, which resists carmine staining and is less granular than the third and fourth. It exists in the same brain with the fourth variety. These spots or masses of the fifth variety are called "colloid," because of their resemblance to such growth, and are found in the medulla oblongata and pons Varolii. The last three varieties of degenerated masses, or spots, have one feature in common—a well-defined edge, a clean-cut margin, easily made out.

VI. A sixth variety, common in cases of dementia, and where the atheromatous capillary is found, is one in which the mass passes insensibly into the surrounding normal tissues. This form is larger and less distinct than the others. It more nearly resembles normal brain tissues. Sometimes these masses are lobulated. They are granular and dense, less numerous than in the other varieties, and do not appear in clusters. They appear to destroy or transform the tissues, and if surrounding a capillary, destroys its walls. A point of resemblance in common with the third variety is, that connective tissue fibre appears in both.

The condition of the cellular structures of the brain, of the nerve-fibres and so-called lymph-spaces, are all fields rich in results not here spoken of.

Report of One Hundred Observations made with a View to the Determining of the Sex in Utero.—DRS. ALBERT B. STRONG and D. A. K. STEELE reported to the Chicago Medical Society (*Medical Examiner*, August 15, 1874) the following observations deduced from the examination of one hundred cases.

1. In the majority of cases male foetal hearts are slower than female. 2. 132 foetal pulsations per minute is the average which constitutes a dividing line between the sexes. Below this, sixty-eight and four-sevenths per cent. are males, twenty per cent. are females, eleven and three-sevenths per cent. are doubtful. Above this fifty-three and one-third per cent. are females, twenty-six and two-thirds per cent. are males, twenty per cent. doubtful. We have

here, it may be observed, another demonstration of the fickleness of the female heart. 3. The most accurate observations are made during the last four weeks of gestation. 4. The rapidity of the heart's action is increased in proportion to the feebleness of the foetus. 5. Calcareous or fatty degeneration of the placenta renders the pulsations feeble and irregular. 6. In some cases it would be possible to diagnose diseased conditions of the placenta from careful observation of the foetal heart.

Of fifty cases examined consecutively twenty-seven gave birth to female children and twenty-three to males. The lowest rate observed was 118; it occurred but twice; once each in a male and female child. The highest rate noted was 180, occurring three times, twice in males and once in the case of a female. The average rate of the male pulse was 136.3; of the female, 137; of both sexes, 136.7. Considering the latter as the dividing line between both sexes, a pulse at and below this rate may be referred to males, and that above it to females. In twenty-six cases the sex was correctly predicted, and in twenty-four an error was made.

If the cases be excluded where there was unusual activity of the foetus, the average rate of the male pulse will be found to be 133.6; of the female, 136.2; of both sexes, 134.7.

Considering, then, 134 as the dividing line between the sexes, the diagnosis was correct in twenty-four cases and incorrect in twenty-two. If, however, 128 be taken as the dividing line, the diagnosis was correct in twenty-eight cases and incorrect in twenty-two. There were six female children whose pulse was steady below 128; five males had a steady pulse between 128 and 138; three, between 138 and 148; two, between 148 and 158, and one between 158 and 168. So far as the facts elicited from these observations are of value, it is evident that they have utterly failed to furnish a basis for determining the sex in utero.

Our observations were conducted by the aid of an ordinary Camman's stethoscope, and our experience has made it clear that more distinct sounds are audible when the bell of the instrument is moistened and applied to the abdomen without pressure, as the peculiar thrill of the foetal heart is lost when the stethoscope is grasped by the fingers.

In conclusion, it may be generally stated that we find an opinion as to the sex of the child, founded on the rate of the foetal pulse, to be of little more value than a guess, while the presentation, generally, and the exact position, possibly, may be accurately determined.

Diphtheria treated by Local Application of Subsulphate of Iron.—Dr. A. W. NELSON, of New London, Conn., extols (*New York Med. Journ.*, January, 1874) the efficacy of the local application of persulphate of iron in diphtheria. In mild cases he uses liq. ferri subsulphatis, and pure water or glycerin, in equal parts, or two of the latter to one of the former; in severe cases he uses the liquor. f. subsulph. in its full strength. Vomiting may be induced by it at first, but this is rather beneficial. For subsidiary gargles water, chlorate of potass solution, and lime are, he considers, all useful.

The iron as a gargle is disagreeable, from blackening the teeth, and staining white clothes, which are best obviated by employing a large camel's-hair pencil well washed after using.

Of forty cases treated by this method there were, he says, only three deaths.

Of the three deaths, one was moribund when first seen; the second was not treated locally with the subsulphate.

Case of Uterine Fibroid removed according to a New Principle of Operation.—Dr. EMMET reports (*American Journal of Obstetrics*, August, 1874) a case of fibroid tumour of the uterus removed by him the day before. The patient had been suffering from excessive metrorrhagia during the past month, which had been controlled only by the constant use of styptic injections. The uterus was anteverted, and its cavity occupied by a fibrous tumour of the size of a fist; the sound could be introduced to the depth of five inches posteriorly and of three inches anteriorly. Suppositories of gelatine, containing each 16

grains of Squibb's aqueous extract of ergot (equivalent to about 100 grains of powdered ergot) were introduced into the rectum, where they produced but little effect, and then daily, during the last ten days, into the cavity of the uterus itself, with marked beneficial results. The uterus, which at first had been more elongated and pear-shaped, now became broad at its fundus, where it measured no less than four inches; the tumour thus approached the internal os, although its broad attachment to the uterine wall was in no way changed. The great difficulty was to get an instrument or a loop behind or around the tumour, in order to effect its removal. Dr. Emmet retroverted the uterus, seized the fibroid with a double tenaculum, and proceeded to draw it down towards the vulva, in which attempt he succeeded after about half an hour's steady traction, removing portions of the tumour with the scissors as it became attainable. When the fibroid had been brought down to the vulva, Dr. Emmet thought he was inverting the uterus, at which prospect he was not alarmed, for he knew that he could easily return it at once; he found, however, that the uterus had contracted behind the tumour as it was drawn down, and had thus by its individual efforts enucleated the base of the tumour, and at the same time prevented hemorrhage, and made it necessary only to divide the capsule of the fibroid with the scissors in order to remove the whole growth. During the whole operation, which lasted about an hour and a half, hardly a drachm of blood was lost, and that came from the laceration of the fibroid by the double tenaculum. The base of the tumour measured about two inches in diameter; after its removal only a slight depression could be felt at the fundus to indicate the spot where it had been attached. After the operation he followed his usual rule of washing out the uterus with warm water, and painting the whole of its cavity with Churchill's tincture of iodine, as a precaution against septicæmia.

This is the most difficult case of the kind he has seen. A few years ago he removed a similar tumour in the same manner, but did not fully understand the *rationale* of the operation until yesterday. The steady traction used arrests hemorrhage, because it excites the uterus to contract behind the tumour as it is drawn down, and thus to compress the bleeding vessels, besides bringing the fibroid nearer and more convenient for removal. It is not the forcible traction of the fibroid towards the os, that is in the direction of the least resistance, but the *vis a tergo*, the contraction of the uterus behind the tumour, which gradually lifts the latter from its bed and enucleates it. This steady traction may be of service, if repeated at regular intervals, in bringing uterine fibroids within reach and making them amenable to operation, and may, perhaps, even accomplish their gradual enucleation.

INDEX.

A.

Abdomen, penetrating wounds of, 147
 Abdominal section for intussusception, 48, 258
 ————— for volvulus, 265
 Adenoid disease, 489
 Alabama Medical Association, notice of Transactions of, 206
 Albuminuria in exophthalmic goitre, 250
 Alcohol, on the elimination of, 531
 Alcoholism, rheumatism, etc., 153
 Allbutt, dizziness and migraine, 249
 —————, relation of derangement of vision to migraine, 272
 Althaus, unusual mode of lead poisoning, 252
 Amenorrhœa from malformation, 199
 Amyl, nitrite of, in epilepsy, 202
 —————, valerianate of, 537
 Anæsthesia by intravenous injection of chloral, 260
 ————— by compression, 550
 ————— in obstetrics, 570
 Anæsthetics, influence of, on vaso-motor centres, 291
 Andrew, medico-chirurgical cases, 489
 Andrews, restraint of hemorrhage during operation in mouth, 290
 Aneurism, cirroid, injection of perchloride of iron in, 263
 ————— of neck, ligation of carotid, 286
 ————— of thoracic aorta perforating the sternum, 400
 —————, treatment of femoral, 559
 —————, ————— of gluteal, 559
 —————, ————— of inguinal, 559
 —————, ————— of popliteal, 560
 —————, pulmonary, 540
 —————, of left subclavian treated by distal ligation, 580
 Angeioleucitis of lungs, 249
 Anstie, elimination of alcohol, 531
 Aorta, aneurism of, perforating sternum, 401.
 Aphasia, 538
 Apnoea and its influence on convulsions, 530
 Apomorphia as an expectorant, 537
 Arnold, diapedesis, 239
 Arthus, static electricity in nervous rheumatic affections, notice of, 509
 Ashhurst, laparotomy for intussusception, 48, 285
 Asylums, probationary, 213
 Atrophy, progressive muscular, 476
 Atropia in profuse sweating, 258, 544
 Atthill, chloride of iron in post-partum hemorrhage, 281
 Aufrecht, carbolic acid in erysipelas, 257
 —————, endometritis, 197

B.

Baillie, chloral in asthma, 544
 Baker, erythema serpens, 494
 Baldwin, relation of ozone to disease, 416
 Bantock, unilocular ovarian cysts, 195
 Bardinet, syphilis communicated by mid-wife, 282
 Beard and Rockwell, Electro-Surgery, notice of, 509
 Bed-elevator and carriage, 158
 Begbie, albuminuria in exophthalmic goitre, 250
 Bennett, coca, 245
 Betz, abdominal section in volvulus, 265
 Bibliographical Notices—
 ————— Cholera, recent works on, 513
 ————— Da Costa, Strain and Over-Action of Heart, 504
 ————— Electro-Therapeutics, 508
 ————— Erichsen, Hospitalism and Causes of Death after Operations, 512
 ————— Evans, History of American Ambulance in Paris, 521
 ————— Farabeuf, Ligation of Arteries, 523
 ————— Flint, Conservative Medicine, 505
 ————— Griffith's Formulary, 234
 ————— Hogg, Skin Diseases, 524
 ————— James, Laryngoscopy, 523
 ————— Medico-Chirurgical Transactions, 469
 ————— Modern Medical News (Japan), 526
 ————— On Government of Retreat for Insane at Hartford, 221
 ————— Peugnet, Gunshot Wounds of Abdomen, 223
 ————— Philadelphia Board of Health Report, 509
 ————— Proceedings of Dublin Obstetrical Society, 197
 ————— Reports of American Hospitals for the Insane, 228
 ————— Report of the New York Board of Health, 215
 ————— Reports of State Boards of Health, 208
 ————— Saint Bartholomew's Hospital Reports, 485
 ————— Schmidt, Blood Corpuscles in Man, 507
 ————— Transactions of American State Medical Societies, 205, 495
 ————— Transactions of Obstetrical Society of London, 193
 ————— West, Diseases of Children, 225
 ————— West Riding Lunatic Asylum Reports, 201
 ————— Woodward, Lecture on Cancer, 219
 Bickersteth, ligature of innominate, 470
 Bile ducts, changes in liver following ligation of, 493

Bile ducts, origin of, 240
 —, spectrum of, 287
 Billroth, extirpation of larynx, 268, 562
 —, removal of tumour from bladder, 561
 Binz, bromide of potassium, 536
 Bishop, new apparatus for fracture of neck of femur, 155
 Black, bromide of ammonium in catamenial excesses, 289
 Bladder, drainage in chronic inflammation of, 290
 —, structure and functions of, 240
 —, with a pouch communicating with a third ureter, 240
 —, removal of tumour from, 561
 —, hair-pin in female, 577
 Blood-stains, diagnosis of, 102
 —, corpuscles, origin of coloured, 507
 —, change of shape in septi-cæmia and fever, 541
 Bourneville, monobromide of camphor, 537
 Bowditch, influence of anæsthetics on vaso-motor centres, 291
 Boyd, preternatural cavities in brain, 482
 Brachial plexus, exsection of, 29
 Brain, cavities in, preternatural, 482
 —, convolutions of, in relation to intelligence, 201
 —, injury of, and pulmonary hemorrhage, 529
 —, localization of function, Ferrier on Bartholow's experiments on, 235
 — further researches on 236, 529
 — of the insane, 581
 —, trephining in abscess of, 487
 Brandt, extirpation of kidney, 266
 Breast, excision of, by scissors cutting under ether spray, 554
 Bright's disease, pathology of chronic, 477
 Bromal hydrate, action of, 534
 Bromide of potassium, action of, 536
 —, in intermittent fever, 256
 — of ammonium, in catamenial excesses, 289
 Bronchocoele, treatment of, 270
 Brown, nitrite of amyl in epilepsy, 203
 Brunton, diuretic action of digitalis, 534
 —, warmth in preventing death from chloral, 547
 Bucknill and Tuke, *Psychological Medicine*, review of, 459
 Bull, retinal hemorrhage, 37
 Burdel, eucalyptus, 241
 Burman, heart disease and insanity, 203
 Bussey, dactylitis syphilitica, 434
 Butlin, tumours, 486

C.

California, Report of State Board of Health of, notice of, 212
 — Medical Society's Transactions, notice of, 501
 Callender, medico-surgical cases, 469
 —, removal of needle from heart, 471
 —, two years of hospital practice, 485
 Camphor, monobromide of, 537

Cancer, Woodward on, notice of, 219
 Carbolic acid in intermittent fever, 257
 — hypodermically in erysipelas, 257
 Carotid, ligation of common, 286
 Carter, pathology of leprosy, 481
 Catamenial excesses, bromide of ammonium in, 289
 Cataract, treatment of, prior to operation, 273
 — operations, results of, 563
 Catarrh of middle ear, non-purulent, 469
 Cavities, local treatment of lung, 253, 313
 — in brain, preternatural, 482
 Chauvel, cloral in tetanus, 262
 Cheever, naso-pharyngeal polypi, 291
 Cherru, resection of knee, 268
 Chest, penetrating wounds of, 147
 Chloral, in asthma, 544
 —, in cholera, 545
 —, in hydrophobia, 545
 —, importance of purity of, 246
 —, in malarial congestion, 577
 —, in rheumatism, 546
 —, in phthisis, 428
 —, physiological action of, 534
 —, in tetanus, 260, 262, 557
 —, intra-venous injection of, 260, 534
 —, in vomiting of pregnancy, 290
 —, warmth in preventing death from, 547
 Chloroform, action of, 242
 —, narcosis, resuscitation from, 570
 Cholera, notice of recent works on, 513
 Chorea, post-paralytic, 342
 Chouppe, ipecacuanha per rectum, 536
 Churchill, amenorrhœa from congenital malformation, 199
 Coen, physiological action of, 245
 Colles, treatment of hemorrhoids by injection of iron, 560
 Colorado Medical Society, notice of Transactions of, 207
 Colotomy, lumbar, 150
 Colours, perception of, by insane, 202
 Conjunctiva, tubercular ulceration of, 276
 Constipation, habitual and excessive, 440
 Convulsions, influence of apnoea on, 530
 Cooley, double uterus, 575
 Co-ordinating motor power, loss of, a symptom of nervous disease, 452
 Cord, prolapse of umbilical, 579
 Corley, fractures of skull, with reference to operative interference, 269
 Cormack, diphtheritic paralysis, 542
 Cornea, Bader's operation for conical, 563
 Coxalgia, superiority of immobility to resection of hip-joint in, 556
 Critchett, treatment of cataract prior to operation, 273
 Croton-chloral in megrim, 512
 Cunningham, Cholera in Northern India, notice of, 513

D.

Da Costa, Strain and Over-action of Heart, notice of, 504
 Dactylitis syphilitica, 434
 Dalby, non-purulent catarrh of middle ear, 469
 Dalton, spectrum of bile, 287

Death after varnishing, cause of, 530
 Derby, hospitals, 210
 Diapedesis, 239
 Dickinson, surgical kidney, 473
 Digitalis, diuretic action of, 534
 Diphtheria, 542, 583
 District of Columbia Medical Society's
 Transactions, notice of, 498
 Dizziness and its connection with migraine,
 249
 Dougall, gurjon oil in leprosy, 259
 Drasche, ergotin, 247
 Dropsy, ovarian, 201
 Duckworth, skin diseases, 491
 Duhring, neuroma of skin, 29
 Dumarquay, ligation of femoral for elephan-
 tiasis, 264
 Dyer, podophyllin for acute rheumatism, 286

E.

Ear, etiology of diseases of internal, 377
 Eborth, extension of melano-sarcoma by
 embolism, 152
 Eldridge, use of elastic ligatures, 126
 Elephantiasis arabum, ligature of femoral
 for, 264
 ———— Græcorum, 264
 ————, ligature of external iliac, 558
 Embolism of retina, transitory, 273
 Emmet, removal of uterine fibroid, 583
 Endometritis, 197
 Engelman, prolapse of umbilical cord, 579
 Epilepsy during menstruation from oclu-
 sion of vulva, 199
 ————, nitrite of amyl in, 202
 Epistaxis, sub-sulphate of iron in, 285
 Ergot, active agent of, 248
 Ergotin as an hæmostatic, 247
 ———— in treatment of uterine fibroids, 288
 Erichsen, Hospitalism, notice of, 512
 Erysipelas, carbolic acid hypodermically in,
 257
 Erythema serpens, 494
 Esmarch, bloodless method, 548
 Ether, studies on, 242
 Eucalyptus, 241
 Evans, History of American Ambulance in
 Paris, notice of, 521
 Eye, foreign bodies in, 274

F.

Face presentation in mento-lateral position,
 193
 Farabeuf, Ligation of Arteries, notice of,
 523
 Favre, subclavian pulsation, 539
 Feinberg, cause of death after varnishing
 animals, 530
 Feltz, on the alkalinity of urine, 531
 Femur, fracture of neck of, new apparatus
 for, 155
 ————, ————, treated by immovable ap-
 paratus, 578
 Féréol, hydrophobia, 547
 Ferrier, localization of functions of brain,
 235, 236
 Filehne, influence of apnoea on convulsions,
 530
 Fitzgerald, optic nerve in cases of cerebral
 tumours, 564
 Flint, Conservative Medicine, notice of, 505

Food, review of Pavy on, 447
 Foot, cesophagismus, 250
 Foreign bodies in eye, 274
 Foster, salts in food, 248
 Fothergill, heart sounds in paralysis of in-
 sane, 202
 Fowler, modification of Trousseau's test, 291
 Fox, temperature, etc., in phthisis, 482
 Fractures of femur treated by immovable
 apparatus, 578
 Frantzel, atropia in sweating, 258

G.

Galton, tympanum of the insane, 204
 Gastrotomy in extra-uterine pregnancy, 472
 Gehring, double uterus and vagina, 445
 Gelseminum in odontalgia and facial neu-
 ralgia, 258
 Gibbes, ligation of common carotid, 286
 Glading, gunshot wound of head, 578
 Goitre, belladonna in exophthalmic, 562
 Government of Retreat for Insane at Hart-
 ford, notice of, 221
 Griffith's Formulary, notice of, 234
 Guarana in chronic rheumatism, 258
 Gubler, jaborandi, 241
 Gull, progressive muscular atrophy, 476
 Gurjon oil, in skin affections, 259

H.

Haker, ether and chloroform, 242
 Hamilton, treatment of fractures of femur
 by immovable apparatus, 578
 ————, trembling and loss of co-ordinat-
 ing motor power as symptoms of nervous
 disease, 352
 Harris, Siamese twins, 359
 Haynes, chloral in phthisis, 428
 Head, gunshot wound of, 578
 Health resorts of southern hemisphere, 481
 Heart disease and insanity, 203
 ———— disease and pregnancy, 573
 ————, removal of needle from, 471
 ———— sounds in paralysis of insane, 202
 ————, strain and over-action of, 534
 Hemorrhage, retinal, and its connections
 with other lesions, 37
 ————, post-partum, injection of per-
 chloride of iron in, 193, 279, 281
 ————, restraint of, during operations
 in mouth, 290
 Hemorrhoids, treatment of, by injection of
 chloride of iron, 560
 Hernia, mechanism of strangulated, 551
 ————, strangulated, treated by inversion,
 264
 Heyl, separation of retina and amaurosis
 uræmica, 437
 Higginson, chloral in cholera, 545
 Hiller, change of shape of blood cells in
 septicæmia and fever, 541
 Hogg, Skin Diseases, notice of, 524
 Holden, trephining in abscess of brain, 487
 Holmes, treatment of gluteal, inguinal,
 femoral, and popliteal aneurism, 559, 560
 Hospital practice, two years of, 485
 Hospitals, Derby on, 210
 ———— Insane, notice of reports of, 228
 Hueter, ligature of external iliac in ele-
 phantiasis, 558

- Hutchinson, local treatment of lung cavities, 236
 Hydrophobia, 545, 547
 Hydruria, neuropathic origin of, 238
 Hypodermic injection, seat of, 537
 Hysterotomy and ovariectomy compared, 283
- I.
- Ichthyosis corneæ, 491
 Imbecility with ataxia, 492
 Indiana State Medical Society, notice of Transactions of, 205
 Infant, delivery of puny, 575
 Inflammation, infective product of, 474
 Injections, danger of intra-uterine, 284
 Innominate, ligature of, for subclavian aneurism, 470
 Insane, appearance of the brain of the, 581
 Intermittent fever, bromide of potassium in, 256
 ———, carbolic acid in, 257
 Intraperitoneal injuries, 488
 Intussusception, laparotomy for, 43, 285
 Iodoform, physiological action of, 534
 Ipecacuanha administered by injection, 536
 Irwin, chloral in rheumatism, 546
 ———, resection of radius, 429
- J.
- Jaborandi, 241
 James, Laryngoscopy, notice of, 523
 Jeaffreson, excision of scapula and clavicle, 557
 ———, foreign bodies in eye, 274
 ———, suicidal wound of neck, 486
 Johnson, pathology of chronic Bright's disease, 477
 Jurasz, apomorphia as an expectorant, 537
 Jurié, structure and functions of bladder, 240
- K.
- Kemper, inversion of uterus, 288
 Kempster, brain of the insane, 581
 Kentucky Medical Society's Transactions, notice of, 495
 Kidd, vesico-vaginal fistula, 199
 Kidney, extirpation of, 266
 ———, suppuration in a misplaced, 489
 ———, surgical, 473
 King, alcoholism, rheumatism, etc., 153
 Knee, resection of, 268, 472
 Kupffer, origin of bile ducts, 240
- L.
- Labour, induction of premature, 565
 Landis, transfusion, 527
 Laparotomy for intussusception, 48, 285
 Larynx, extirpation of, 268, 562
 Lead poisoning, unusual mode of, 252
 Le Fort, anæsthesia by compression, 550
 ———, electricity in opacity of vitreous, 563
 ———, tibio-calcanean osteo-plastic operation, 269
 Legg, changes in liver following ligature of bile ducts, 493
 Leprosy, gurjon oil in, 259
 ———, pathology of, 481
 Leukæmia treated by transfusion, 489
 Lewis, researches on cholera, 513
- Lidell, thrombosis of cerebral veins and sinuses, 64
 Liebreich, purity of chloral, 246
 Ligature for prevention of loss of blood, 550
 Ligatures, use of elastic, 126
 Lincoln, Electro-Therapeutics, notice of, 508
 Linn, normal puerperal pulse, etc., 289
 Lithotomy, bilateral, 442
 Lorain, fatal vaginal injection, 282
 Lossen, mechanism of hernia, 551
- M.
- Mackenzie, treatment of bronchocele, 270
 Madden, diseases connected with chronic uterine inflammation, 198
 ———, puerperal convulsions, 567
 ———, uterine polypi, 200
 Magnet, extraction of steel from vitreous by, 564
 Massachusetts, Report of State Board of Health of, notice of, 208
 Maury, excision of brachial plexus, 29
 Mauthner, transitory embolism of retina, 273
 May, bilateral lithotomy, 442
 McGuire, drainage in inflammation of bladder, 290
 McKendrick, chloral and bromal hydrate and iodoform, 534
 McKeon, extraction of steel from vitreous by magnet, 564
 McLean, distal ligation for aneurism of left subclavian, 580
 McNally, carbolic acid in intermittent fever, 257
 Medico-Chirurgical Transactions, notice of, 469
 Melano-sarcoma, extension of, by embolism, 252
 Melanotic tumours, contra-indications to removal of, 271
 Michigan State Board of Health Report, notice of, 224
 Migraine, relation of derangement of vision to, 272
 Minnesota Medical Society's Transactions, notice of, 497
 Missouri Medical Society's Transactions, notice of, 503
 Mitchell, nerve section for traumatic neuralgia, 17
 ———, post-paralytic chorea, 342
 Mollities ossium, 119
 Molluscum fibrosum, 478, 492
 Mooren, results of cataract operations, 563
 Morton, bed-elevator and carriage, 158
 ———, transfusion, 110
 Mosler, local treatment of lung cavities, 253
 ———, neuropathic origin of hydruria, 238
 Murray, Cholera, notice of, 513
 ———, molluscum fibrosum, 478
 Muscular tissue, changes in, after division of nerves, 239
 Mussick, delivery of a puny infant, 575
- N.
- Neck, suicidal wound of, 486
 Neill, mollities ossium, 119
 Nelson, treatment of diphtheria, 583
 Nephrotomy, 489

Nepveu, contra-indications to removal of melanotic tumours, 271
Nerve section for neuroma of skin, 29
——— traumatic neuralgia, 17
Neuralgia, traumatic, 17
Neuritis, double optic, 489
Neuroma, exsection of brachial plexus for, 29
New York Board of Health Report, 215
Nothnagel, injury to brain and pulmonary hemorrhage, 529

O.

Obstetrical Society of Dublin, notice of Proceedings of, 197
——— of London, notice of Transactions of, 193
Oesophagismus, 250
Optic nerve in cases of cerebral tumour, 564
Oré, intravenous injection of chloral, 260
Osteo-plastic operation, tibio-calcanean, 269
Os uteri, chloral in rigidity of, 577
Ovarian cysts, pathology of unilocular, 195
Ovaries from case of normal ovariectomy, 288
Ovariectomy compared with hysterectomy, 283
———, Spencer Wells on, 469
Ovulation without menstruation, 240
Ozone, relation of, to disease, 416

P.

Packard, lumbar colotomy, 150
Pajot, new sign of pregnancy, 574
Paralysis caused by lead poisoning, 252
———, diphtheritic, 542
Parrot, iodoform in gangrenous vulvitis, 284
Pavy on Food, review of, 447
Pepper, local treatment of lung cavities, 255, 313
Perrault, twins in double uterus, 277
Peter, heart disease and pregnancy, 573
Peugnet, Gunshot Wounds of Abdomen, notice of, 233
Pfannkuch, rigor following delivery, 574
Philadelphia Board of Health Report, 509
Phthisis, pulse, etc., in, 482
Piermé, prolapse of vitreous, 274
Pitch, percussion sign of change of, 541
Playfair, necrosis of ossa pubis, 196
Podophyllin for acute rheumatism, 286
Pollak, chloroform, 242
Pollock, mollusum fibrosum, 478
Polypi, uterine, 200
———, treatment of naso-pharyngeal, 291
Porriego decalvans, 491
Power, double optic neuritis, 489
Prangley, diphtheria, 542
Pregnancy, extra-uterine, 197
———, new sign of, 574
———, spurious, 277
Pubis, necrosis of ossa, 196
Puerperal convulsions, 567
——— pulse, etc., normal, 289
Pulmonary aneurisms bordering upon caverns, 540

Q.

Quinia, therapeutical action of, 535

R.

Rabuteau, jaborandi, 241
Radius, resection of, 429

Ransome, respiratory movements, 476
Rattray, analysis of ship air, 478
Rawson, guarana in rheumatism, 258
Rea, penetrating wounds of chest and abdomen, 147
Reese, Toxicology, review of, 173
Respiratory movements, 476
Retina, separation of, and amaurosis uræmica, 437
———, transitory embolism of central artery of, 273
Retinal hemorrhage, and its connections with other lesions, 37
Reviews—
Bucknill and Tuke, Psychological Medicine, 459
Pavy on Food and Dietetics, 447
Reese, Manual of Toxicology, 173
Taylor, Medical Jurisprudence, 185
Van Buren and Keyes on Genito-Urinary Organs, 161
Wood, Treatise on Therapeutics, 181
Reyneaud, angeioleucitis of lungs, 249
Rheumatism, guarana in chronic, 258
———, podophyllin for acute, 286
Rhus toxicodendron, treatment of poisoning by, 160
Richardson, diagnosis of blood-stains, 102
———, scissor cutting under ether spray, 554
Richet, aphasia, 538
———, hysterotomy and ovariectomy compared, 283
Rigor following delivery, explanation of, 574
Ringer, croton chloral in megrim, 543
Ringland, perchloride of iron in post-partum hemorrhage, 279
Roosa, etiology of diseases of internal ear, 377
Routh, intra-uterine stems, 197

S.

Saint Bartholomew's Hospital Reports, notice of, 485
Salts, importance of, in food, 248
Sanderson, infective product of acute inflammation, 474
———, localization of brain functions, 529
Sattler, tubercular ulceration of conjunctiva, 276
Savory, treatment of stricture by retention of catheter, 487
Scapula and clavicle, excision of, 557
Schiff, ether and chloroform, 242
Schmidt, Origin of Blood Corpuscles, 507
Sclerema, 491
See, therapeutic action of quinia, 535
Sex, determination of, in utero, 582
Sharpe, hair-pin in female bladder, 577
Shaw, imbecility with ataxia, 492
Ship air, analysis of, and its effects, 478
Siamese twins, 359
Sigmund, treatment of syphilis, 552
Simmons, chloral in vomiting of pregnancy, 290
Simon, extirpation of kidney, 266
Sims, resuscitation from chloroform narcosis, 570
Skull, fractures of, with reference to operative interference, 269

Smith, belladonna in exophthalmic goitre, 562
 —, intra-peritoneal injuries, 488
 —, perchloride of iron in post-partum hemorrhage, 193
 South Carolina Medical Society's Transactions, notice of, 499
 Southey, adenoid disease, 489
 Spleen, extirpation of, 271
 Staub, sub-sulphate of iron in epistaxis, 285
 Stems, use of intra-uterine, 197
 Sternum, perforation of, by aneurism of aorta, 400
 Stoddard, extirpation of kidney, 268
 Stricture of urethra, report of cases of, 129
 —, treatment of, by retention of catheter, 487
 Strong, determination of sex in utero, 582
 —, habitual and excessive constipation, 440
 Subclavian aneurism, ligature of innominate, 470
 —, pulsation of, sign of dilatation of aorta, 539
 Sulphate of zinc in poisoning by rhus, 160
 Swayne, induction of premature labour, 565
 Sweating, atropia in, 258
 Syphilis communicated by midwife, 482
 —, treatment of, 552

T.

Tait, gastrotomy in extra-uterine pregnancy, 472
 Taylor, Bader's operation for conical cornea, 563
 —, Principles of Medical Jurisprudence, review of, 185
 —, chloral in malarial congestion, 577
 Tetanus, chloral by the mouth in, 262
 —, intra-venous injection of chloral in, 260
 Thomas, chloral in rigidity of os uteri, 577
 Thompson, health resorts of southern hemisphere, 481
 Thornton, strangulated hernia treated by inversion, 264
 Thrombosis of cerebral veins and sinuses, 64
 Transfusion, 110, 263, 527
 Trembling, symptom of nervous disease, 352
 Trommer's test, modification of, 291
 Tumours, fatty, 486
 — removed at St. Bartholomew's Hospital, 486
 Turner, convolutions of brain in relation to intelligence, 201
 Twin pregnancy in double uterus, 277
 Twins, Siamese, 359
 Tympanic membrane of the insane, 204

U.

Underhill, spurious pregnancy, 277
 Ureters, three, 240
 Urine, on the alkalinity of, 531
 Uterus bicornis, complete, 196
 — and ovaries, extirpation of, 206
 —, chronic inversion of, 250
 —, double, 445, 575
 —, —, twin pregnancy in, 277
 —, ergotin in fibroids of, 288
 —, hypertrophic elongation of cervix of, at full term, 196
 —, inversion of, 288
 —, partial severance of cervix of prolapsed, by matted hair, 193
 —, removal of fibroid of, 583
 —, treatment of diseases connected with chronic inflammation of, 198

V.

Vagina, fatal result of injection into, 282
 Vallin, bromide of potassium in intermittent fever, 256
 Van Buren and Keyes on Genito-Urinary Organs, review of, 161
 Vanderveer, stricture of urethra, 129
 Vesico-vaginal fistula, treatment of, 199
 Viennois, superiority of immobility to resection of hip-joint in coxalgia, 556
 Vision, relation of derangements of, to migraine, 272
 Vitreous electricity in opacity of, 593
 —, prolapse of, 274
 Volvulus treated by abdominal section, 265
 Vomiting of pregnancy, chloral in, 290
 Vulvitis, iodoform in gangrenous, 284

W.

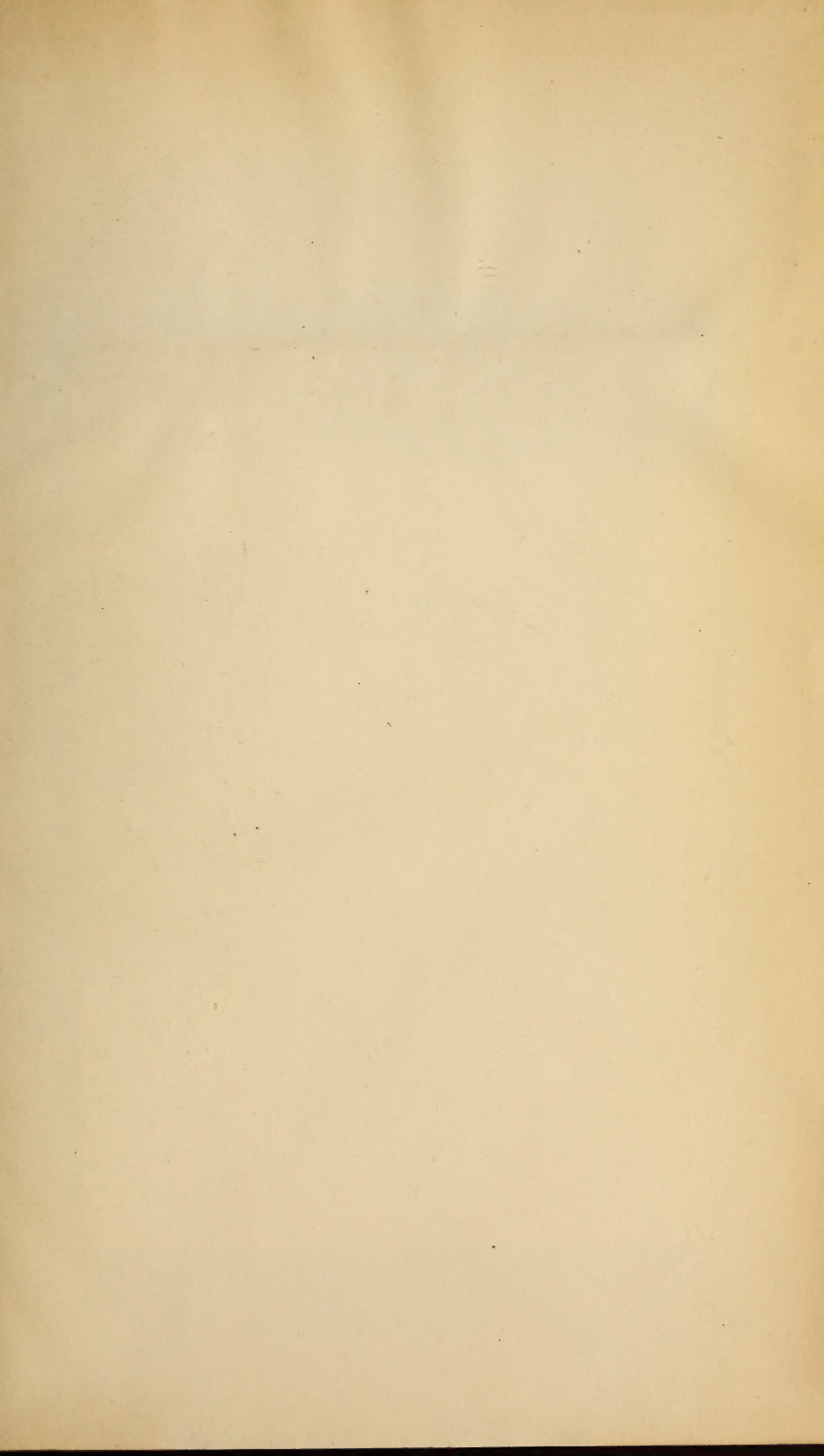
Watson, extirpation of spleen, 271
 Webb, aneurism of aorta perforating sternum, 450
 Weil, change of pitch, 541
 Wells, fifth series of one hundred cases of ovariectomy, 469
 Wernich, active agent of ergot, 248
 West on Diseases of Children, notice of, 225
 —, injection of perchloride of iron in cirroid aneurism, 263
 West Riding Lunatic Asylum Reports, notice of, 201
 Williamson, atropia in sweating, 544
 Wilson, gurjon oil in skin affections, 259
 Wood, Therapeutics, review of, 181
 Woodward, Cancer, notice of, 219

X.

Xeroderma with brown ichthyosis, 491







Date Due

[illegible]

American Journal
Med. Sciences.
Vol. LXVIII-N.S.
1874

SMITHSONIAN INSTITUTION LIBRARIES



3 9088 01224 9892